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An Address ON THE MYOCARDIUM*

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THE subject I have chosen, viz., the myocardium, should, I think, prove interesting, for it is in all probability the most important structure in the body, not only because it is the main-spring of the circulation—and I would remind you that it is upon the efficiency of the circulation that the growth and adequate functioning of every tissue and organ of the body depends—but also because, whether you die peacefully in your bed at night, or violently and painfully in the course of your daily work, it is almost invariably the failure of the myocardium that kills.

Although I emphasize the fact that the myocardium supplies the energy for the circulation, I would also point out that the efficiency of the circulation as a whole depends, not only on the myocardium, and on the valves of the heart (the main functions of which are to direct the course of the blood and rest the myocardium) and its nervous control, but also upon an efficient venous return and the vaso-motor mechanism, together with the musculature of the arterioles. How important each of these factors really is, only becomes obvious when one of them, and more especially the myocardium becomes damaged and relatively more strain or work is

thrown on the others; for instance, the importance of the venous return in aortic regurgitation cannot be overstated, an efficient *vis a fronte* being of vital importance in procuring rest for the left ventricle.

The understanding of any myocardial defect must depend primarily upon a knowledge of the anatomy, physiology and histology of the normal or physiological myocardium which resembles all other muscles of the body, in that it possesses the properties of irritability, tonicity, conductivity and contractility, but differs from all other muscles in that these properties are specialized and localized in different regions to subserve very definite purposes in the circulation.

All parts of the myocardium are irritable, but the most irritable part of the heart is a specialized region in the wall of the right auricle between the superior and inferior vena cava, known as the sino-auricular node, and it is this most irritable part of the heart which initiates the beat. Should any other part become more irritable, from any cause such as poisoning, degeneration, fatigue, etc., it initiates the contraction and the beat is said to be ectopic. Ectopic beats may arise in any part of the myocardium—auricles, auriculo-ventricular bundle, or ventricles—and may occur as isolated contractions, or in definite sequence, giving rise to many

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different irregularities; such irregularities may often be a very early sign of myocarditis, as in the case of the tobacco heart.

Tonicity, though common to all parts, determining the form and, to a certain extent, the size of the heart, is specialized in the region of the auriculo-ventricular rings, and is responsible for valve efficiency and competence. Should the tone become impaired from any cause, not only is the heart altered in form and size and its efficiency impaired, but the valves tend to become incompetent; at first, only under strain or load, but later continuously, so that atonicity murmurs make their appearance.

The Atonic Heart, sometimes called the sessile heart, the clerk's heart, or the concertina heart, is often the first obvious result of chronic myocardial infection, and as the atonic heart is so important, I feel I should here summarize its chief features:

It is a large heart, with apex beat in or outside the nipple line. The transverse cardiac dullness is increased.

It is an inefficient heart, with exercise tolerance low.

It is a "soft heart" with apex beat slapping in character; the differential stethoscope gives a 1:1 reading, and the first sound on auscultation is short.

It is often an irregular heart, owing to extrasystoles. Atonicity and irritability are often associated.

The electrocardiogram shows usually a left-sided preponderance, inversion of T_1 ; not infrequently inversion of lead III; all leads tend to be sub-physiological in character; the right main branch block is not uncommon. T_2 is often impaired.

Conductivity is the most highly differentiated of all the properties of heart muscle, and is specialized in the bundle system, a complex network which spreads throughout the myocardium and distributes the stimulus throughout it, functioning as a modified end organ. The bundle system commences at the irritable sino-auricular node, travels throughout the auricular wall and converges to the auriculo-ventricular node, whence it passes downwards as the bundle of His, which rapidly divides into two main branches, a right and left; of this the right runs along the right side of the septum, crosses the right ventricle in the moderator band, to be distributed to the right papillary muscle and the wall of the right ventricle generally. The left branch passes along down the left side of the septum towards the apex, where it divides like the right into a number of terminal branches, which pass up towards the base, so as to form a kind of calyx.

This bundle system is shown diagrammatically

in the annexed drawing, which will enable one to understand at a glance the different parts of the bundle system.

Infection, or other forms of damage, involving different parts of this bundle system, results in the different varieties of heart block. For example, if the damage falls above the sino-auricular node, the whole heart is liable to a "cut out", with sino-auricular heart block as the result. If the auricular wall itself becomes damaged, as in interstitial myocarditis, intra-auricular block results; while, if the septum is picked out, auriculo-ventricular block, either partial or complete, follows: or, again, the left or right main branches may be involved, right or left main branch block resulting. Finally, the terminal branches may be affected when either an apical or basal arborization block is said to occur.

Contractility again, though common to all parts of the myocardium, is specialized in the walls of the ventricular bases (pulmonary and aortic) and supplies the driving power for the pulmonary and systemic circuits. Damage, therefore, to either pulmonary or aortic bases must necessarily be associated with impaired efficiency in either the pulmonary or systemic circulations. The importance of correctly assessing this part of the myocardium in any given case cannot be over-emphasized. The importance, for example, of recognizing any damage to the pulmonary base in a case of mitral stenosis, or failing to recognize damage to the aortic base in a man who has a pain in his chest, should, I think, be obvious to anyone.

One other consideration is, I think, vital to the understanding of myocardial problems; this is the functioning as a whole, of the different parts of the heart.

The Auricles receive the blood from the systemic veins or lungs and pass it on to the ventricles; they are merely receiving chambers and are not vital to the circulation. Their contractility and tonicity are of relatively little real importance in the essential scheme of the circulation, and an efficient "working" circulation can go on for years with the auricles "blown out", and acting merely as passive chambers between the systemic veins and ventricles. *The right auricle* has, however, the additional function of originating the normal beat of the heart, so that injury to it is very usually demonstrated by irregular or dis-

ordered heart action, and I would specially stress the point that, although this damage to the auricle calls attention to myocardial defects, the really vital injury must be looked for in the essential ventricular muscle.

The importance of auricular irregularities (or any other irregularity for that matter) is largely due to the fact that they draw attention to some myocardial defect, the gravity of which depends upon: (1) the extent to which the ventricles are involved in overwork by irregular over-stimulation; (2) whether or not the process which has caused the auricular damage has also involved the ventricular walls.

I feel I cannot over-emphasize this point, as so much stress has been laid upon auricular irregularities in recent years, so little attention paid to what they may imply in relation to the ventricular myocardium.

The auricular irregularity should be regarded as an alarm signal, drawing attention to some destructive process going on in the myocardium, possibly in the vital ventricular muscle. During the past few years I have been often called in to see cases where the auricular damage has been accurately assessed, but where the really important ventricular condition has been entirely overlooked, and here I desire to emphasize the fact (not clearly stated as far as I am aware in any text-book) that all and every cardiac irregularity, with the possible exception of the sinus arrhythmia, means abnormal myocardial action, just as an endocardial murmur means a valve defect. The nature of the irregularity depends upon the particular function of the myocardium interfered with: alteration means impaired contractility, premature beats, hyper-irritability, auricular fibrillation or the different varieties of heart block, impaired conductivity.

The Ventricles receive blood from the auricles and transmit it with considerable force into the pulmonary or systemic circulations. The ventricular systole commences in the right papillary muscle; the chordæ tendineæ of the tricuspid valve are made tense and the valve rendered competent, thus giving the pulmonary circuit a slight lead, which, of course, makes for mechanical efficiency.

An Efficient Right Heart (ventricle) means an efficient pulmonary circulation, and the efficiency of the right heart depends upon:—

Adequate filling.
Myocardial integrity, especially of the pulmonary base.
An efficient tricuspid tensing mechanism.
Systematic stimulation.
A free outlet.

The assessment of the right heart under the above headings is of vital importance in such conditions as pulmonary oedema, mitral stenosis, etc.

An Efficient Left Heart (ventricle), means an efficient systemic circulation and its efficiency depends on:—

Adequate filling.
Myocardial integrity of the aortic base.
Efficient valve closure.
A normal supra-ventricular stimulus.
A free outlet.

The above very brief consideration will, I hope, enable one to appreciate the more important points in connection with diseases of the myocardium for, without a knowledge of this I believe an understanding is impossible.

Inflammation generally is usually regarded as being due to certain well recognized causes, such as traumatic injury, bacterial toxins, organic or inorganic poisons, etc. In the case of the myocardium, although all the above may operate, the more commonly accepted causes of myocarditis are relatively few in number. Some of them, for example the virus of rheumatism, or syphilis, or diphtheria are well known and are universally accepted; others, such as the toxins of influenza or the secretion of the thyroid gland have only comparatively recently been recognized as producing a definite myocarditis. Some toxins, those of diphtheria, for example, act very quickly and produce a very acute degenerative form of myocarditis within twenty-four hours. Others, such as some of those absorbed from the mouth or bowel, act very slowly, taking years to produce their effects. It is probably correct to state that most forms of myocarditis are toxic in origin and are curable in this stage, but are very liable to pass on to a degenerative stage later. This is well seen in the case of a thyro-toxic myocarditis, which is completely curable in the toxic stage by appropriate surgical treatment of the thyroid, but is unaffected by such treatment after the degenerative stage has set in. The above remarks also apply to syphilis and, to a less extent, to other forms of myocarditis; in fact I think one might summarize the position by saying that most forms of myo-

carditis pass through a toxic stage in which they are curable and a degenerative stage in which they are not curable, but that the time taken to pass from the toxic to the degenerative stage varies very greatly, in fact from a few hours to years. Different poisons which act on the heart muscle appear to produce many of their signs and symptoms in virtue of their having some special affinity for some special part of the myocardium, or for one of the properties of muscle. Tobacco, the virus of malaria or dysentery, raise the irritability before producing any other obvious effect; while ouabain or quinidine appear to pick out the conducting system, producing complete dissociation of the different chambers of the heart, so that in the case of a frog's heart under ouabain, a graphic record shows the contraction of the three different chambers. Most bacterial toxins impair the tone of the heart muscle, so that atonicity is usually an early sign of a poisoned heart, often, in fact, the first. The same poison, however, may affect different hearts differently. Digitalis may produce coupling of the beat in one case, block in another, and this depends, not upon the drug itself, but upon the pre-existing state of the heart muscle, the most damaged part being affected first.

The Special Signs of Myocarditis depend on the part affected. If the auricles are specially picked out, auricular fibrillation, auricular flutter or auricular extrasystoles, singly or in runs, or intra-auricular block are liable to occur. If the septum is involved, nodal extrasystoles, nodal rhythm, heart block, either complete or incomplete, result. If the ventricles are affected, extrasystoles, either singly or in twos (bigeminy) or threes (trigeminy) or in the form of paroxysms, may occur. Damage to either right or left main branch or the terminal branches may result, or even ventricular fibrillation itself, when sudden death occurs.

The Symptoms Produced by Myocarditis depend upon interference with the function of the different parts affected. For example, the auricles, being of comparatively little importance in the essential scheme of the circulation, cause little general disturbance, but if the septum is involved, ventricular slowing results and the cerebral circulation is in special difficulty, so that syncopal attacks (Stokes-Adams' fits) are liable to occur.

Damage to the right ventricular wall may result in either ventricular extrasystoles, or paroxysmal tachycardia or right branch block; in any case there is embarrassment of the pulmonary circulation, so that dyspnoea, cyanosis, cough, conscious epigastric pulsation, together with a sensation of fullness in the throat, or pain in the chest at the *commencement* of exercise, especially in the cold, or after meals, are liable to occur. If the basal part of the right ventricle is involved, the pulmonary pump is specially affected. If the right branch of the bundle of His is damaged, the tricuspid mechanism becomes defective.

Damage to the left ventricle results in interference with the general systemic circulation, and this is particularly liable to occur if the aortic base is affected—a lesion often associated with damage to the left coronary artery. Pain, a sense of constriction on exertion or even sudden death may occur.

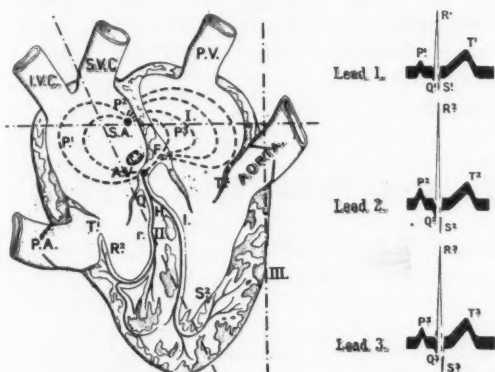
THE ELECTROCARDIOGRAPH

Of all the methods, instrumental or otherwise, which have been introduced at various times in connection with the study of the heart and circulation generally, and of the myocardium in particular, none has proved so valuable for elucidating the mystery of the myocardium as the electrocardiograph; an instrument which gives a graphic record of the functioning of the heart muscle and enables one to study the actual working of the myocardium under its normal physiological, or abnormal pathological conditions.

It is often said that the electrocardiograph enables one to analyse cardiac irregularities, and one might be led to believe that this is the main use and function of the instrument. I would point out and emphasize the fact that it is useful for analysing irregularities because all irregularities, with the possible exception of the sinus arrhythmia, are indications of abnormal myocardial action, and it is because they are the result of myocardial action that they are "analysable" by the electrocardiograph. The use of the electrocardiograph, however, should certainly not be limited to the analysis of irregularities for, no matter how the myocardium is functioning, it is reflected in the electrocardiographic curve, so that one is enabled to map out the myocardium, whether it be normal or ab-

normal, and whether that abnormality depends upon primary changes in it, or upon changes brought about secondary to some valve lesion. Can anything, short of the actual heart itself, give one such an accurate picture of the changes that have taken place in the heart in mitral stenosis? Or what other method is there that can picture the changes that occur in the heart in the agony of the anginal attack? In my experience, there is no part of the myocardium the condition of which cannot be accurately gauged by this means.

PLATE I



(a) Diagrammatic section through heart showing general relationship of parts: bundle system indicated by solid line.

S.A.=Sino-auricular node.

A.V.=Auriculo-ventricular node.

Broken lines joining S.A. and A.V.=Intra-auricular paths.

H=Bundle of His.

r=Right main branch of bundle system.

l=Left main branch of bundle system.

I, II, III — —, lines=Electrocardiographic leads.

I, is led off between arms.

II, Between right arm and left leg (axial lead).

III, Between left arm and left leg.

P, P₁, P₂, etc.=waves of electrocardiographic curves

(b) in different leads.

The position of the different letters T₁, T₂, etc., indicates the part of the myocardium to which they correspond, e.g., R₂ indicates that the R wave in lead 2 is produced by contraction of the right papillary muscle.

(b) Physiological electrocardiograms of young, healthy men under 30 years of age. These curves represent typical normal records constructed from the mean measurements of a series of normal electrocardiograms obtained from the students of the Middlesex Hospital, London, 1913. They should be used as a standard for comparison with abnormal curves obtained in different pathological conditions.

Before the electrocardiograph can be of any real use, however, it is necessary to learn how to use it properly, and to learn the normal physiological curve, for without a knowledge of either of these, I have no hesitation in saying that it is a dangerous and misleading instru-

ment and, in the hands of the ignorant, careless or unscrupulous, may become a menace to the public.

Many myocardial defects, e.g., right or left bundle block or arborization block, cannot be identified by any other means, while the analysis of many tachycardias is also made impossible without this instrument.

The above are some of the more important points in connection with the myocardium itself. But what of the *myocardial patient* as an individual? You all, I am sure, know such cases well, but may I just describe two of the more common types.

Type I.—The man who wears out his heart.

He is the active, restless, business or professional man, usually rather tall and thin with a pale, patchy, rather pinched face, grey-haired, beginning to get bald, a slight stoop, thick, tortuous temporal arteries, and cold, blue extremities.

On examination he is wasted and often wasting, chest rigid, epigastric and supra-sternal pulsations often present, while the brachial arteries are thick, tortuous and often locomotor. The heart is enlarged, the apex beat in or outside the nipple line, often slapping in character, while on auscultation the first sound at the apex is short, sometimes reduplicated. A murmur may or may not be present, and a canter rhythm is by no means uncommon. The aortic second sound may be ringing or accentuated. The blood pressure, both systolic and diastolic, is usually high. His complaints are: not sleeping well; has to get up at night to pass his water; losing weight; tires more easily; short of breath on exertion; a sense of discomfort in his chest, especially on exertion, in the cold, after meals, or on excitement; flatulence after meals, and a general feeling of getting old. And the post mortem shows general signs of cardio-vascular degeneration.

Type II.—The woman who sacrifices her heart.

You know her well. She is short, fat, red or blue in the face and markedly dyspnoic. Her ankles are swollen, especially at night, and she complains that she cannot do her washing; that the stairs "kill her", or that the children are too much for her. Her feet ache, she sleeps badly and has to have more pillows at night; she gets up, little, if any, better for her night's rest.

On examination you find a large, soft, flat,

horizontal heart, with a concertina movement; a slapping, feeble apex beat and canter rhythm; a high blood pressure, and on electrocardiographic examination, a right main branch block. If there is a post mortem you find a large, flabby, pale heart, histologically fibro-fatty. It is the heart of sacrifice or personal neglect, call it what you will, but recognize it and don't label it "functional", and by so doing add to the miseries of one who has sacrificed her myocardium on the altar of duty, a slave to the

needs of a family often unseeing and unappreciative.

In conclusion, gentlemen, I thank you for your attention, and if I can go away feeling that I have told you anything of interest, anything which may perchance enable you to get a more vivid and clearer conception of the working of the myocardium, or anything which may enable you to prescribe a rational line of treatment, I shall be satisfied and shall not feel that the time I have spent in coming over here has been wasted. Again I thank you.

An Address

ON

THE SURGEON AND THE ANÆSTHETIST *

By A. PRIMROSE, C.B., M.B., C.M., F.R.C.S., LL.D.

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YOU will recall the fact that within the last few years a duly registered practitioner of medicine in England was charged before the general medical council with "infamous conduct in a professional respect" because he had given an anæsthetic for a bone-setter who was, under the Act, an unqualified person. The practitioner's name was struck from the register. This incident gave rise to much controversy in the public press, in which several prominent members of the profession expressed the opinion that the regulations of the general medical council, under which they were required to take this drastic action, were antiquated and should be revised. The medical council amended its regulation, rescinded its action and restored the name of the offender to the register. When the controversy in the press was active, one of the correspondents in the *Spectator* narrated a story concerning an incident which occurred many years ago in University College Hospital. At the weekly consultation of the staff a patient was under examination who presented peculiar difficulties in diagnosis; one member of the medical staff who was rather fond of parading his piety, asked his colleagues to excuse him for a moment while he retired to engage in prayer: when he

rejoined the group, the chairman Marcus Beck, who was fond of a joke, addressed him thus: "Mr.—— I regret to say I must lay a charge against you before the medical council of infamous conduct in a professional respect, you have been consulting with an unqualified person."

The incident narrated above at all events illustrates the fact that a very close relationship of necessity exists between the anæsthetist and the person for whom he gives the anæsthetic. One might go further and state that to attain ideal conditions both anæsthetist and surgeon should be properly qualified persons who may at least consult together regarding the form of anæsthetic and the method of administration.

The employment of anæsthetics for the purpose of relieving pain during surgical operations is really of more ancient origin than is generally supposed. Dioscorides and Pliny refer to the use of mandragora (mandrake) as employed to prevent pain in surgical operations. For similar purposes Hugo de Lucca used this drug in the thirteenth century. An illusion to it is found more than once in Shakespeare. Iago addresses Othello thus:—

"Not poppy, nor mandragora,
Nor all the drowsy syrups of the world,
Shall ever medicine thee to that sweet sleep".....

—(Othello, Act III, Scene III).

* Read at the annual meeting of the Canadian Medical Association, Toronto, June 16, 1927.

A Chinese physician, Hoa-tho, used hemp to render patients unconscious during surgical operations in the third century. The use of nitrous oxide gas as an anæsthetic in surgery was suggested by Sir Humphrey Davy in 1800. Faraday demonstrated the anæsthetic effects of ether in 1818.

Although these facts were known in the early part of the nineteenth century it was not until Morton used ether for surgical procedures in 1846 and Simpson discovered the value of chloroform in 1847, that general anæsthesia, as we now understand the term, was employed as a routine measure in surgical procedures. Later, local anæsthesia was exploited and many drugs have been used and many methods have been elaborated for its production. Bier first induced spinal anæsthesia in 1898 using cocaine for the purpose, this was subsequently replaced by stovaine, a substance first discovered by Fournneau in 1904. The "Block" method of inducing anæsthesia with its various modifications is a more recent development, and for the production of general anæsthesia rendering the patient unconscious we have not only the ordinary inhalation method but such variants as rectal anæsthesia and the intracheal form.

This short historical sketch will suggest that the relationship between the surgeon and the anæsthetist has of necessity altered during the gradual evolution of modern methods for the abolition of pain and consciousness during operations. In the early days the surgeon undoubtedly had the sole responsibility for the anæsthetic. Later, the responsibility shifted more and more to the anæsthetist, until eventually, when the trained anæsthetist came on the scene, he became solely responsible for the administration while, at the same time, working in close co-operation with the surgeon, in controlling the effect produced on the one hand by the anæsthetic, and on the other by the operation *per se* as it progressed.

Let me illustrate my thesis by reference to the conditions which obtained when I was a student in Edinburgh. There was no trained anæsthetist present at the operation in the Edinburgh Royal Infirmary. The anæsthetic was given by a student. Each of the clerks of the final year in medicine, took turns in the capacity of "chloroformist" as the administrator was called. The chloroform was poured upon an open mask and was inhaled with a large admixture of air. The student was instructed to watch the respira-

tions, on the theory that the respiratory centre failed first, and danger signs were always to be noted there, before cardiac failure occurred. In the light of our present day knowledge it is remarkable to note that death under an anæsthetic was extremely rare, so that, for example, the professor of surgery in my day, a man of very wide experience, was able to state that he had never had a death under chloroform. The remarkable fact is that the surgeon, while performing his operation, was constantly alert to observe any change in the respirations. This might almost seem incredible and yet these men trained themselves to assume this responsibility. I remember discussing this with the late Professor Caird a few years ago. He told me that without any conscious effort on his part he never failed to observe the breathing, or any change in the respirations of his patient. We can recall the enormous amount of abdominal work done by Professor Caird; witness his published records, for example, of his experience in the surgery of malignant growths in the large bowel, and yet he continued to the end of his career to retain his personal supervision, in the manner indicated, of the administration of the anæsthetic. It used to be said that ether was preferred to chloroform by the London surgeons because the London men did not know how to administer chloroform. With equal truth it might be remarked that, in those days, the Edinburgh men did not know how to administer ether. When Lister moved to London from Edinburgh his preference for chloroform, and yet his apparent suspicion that in London they might possibly use ether with greater advantage, was expressed by his parody of those familiar lines from the Beggar's opera:—

"How happy would I be with ether
Were t'other dear charmer away."

Unquestionably the whole situation is changed because of the advent, in recent times, of the specialist in anæsthesia. At a recent discussion on anæsthesia before the American Surgical Association (May, 1927), Dr. Finney stated his opinion that possibly the greatest real advance, in our surgical life time, was the introduction of the trained anæsthetist. The President, Dr. Harvey Cushing, accentuated this view when he remarked that he considered the choice of an anæsthetist was often more important than the choice of the anæsthetic, a sentiment which has frequently been voiced by the writer, in similar terms. Dr. Cushing also told us that, when he had him-

self to take a general anæsthetic, he chose chloroform, because he knew that the man who was on that occasion selected to give the anæsthetic was most expert in the administration of chloroform. Thus it comes about, that to-day the specialist in anæsthesia fills a rôle of the greatest significance in the conduct of surgical procedures. A rôle the importance and responsibility of which cannot be exaggerated.

When we speak of the "trained anæsthetist" we refer to one who specializes in anæsthesia, and it is to the advent of such an one we refer, when recording the pre-eminent contribution made by him to the progress of surgical art. Nevertheless, we must recognize the fact that an anæsthetic is, of necessity, often given by one who is not a specialist in its administration. It, therefore, becomes necessary to arrange for adequate teaching in our undergraduate course, and possibly to provide post-graduate instruction in anæsthesia. The surgeon who journeys to some remote part of the country is often required to operate with the assistance of one who is unskilled in the administration of the anæsthetic. Here, there would be distinct advantage if the operator were trained like the Edinburgh surgeons a quarter of a century ago, who without conscious effort were keenly alert to the effect produced by the anæsthetic as the operation proceeds. Unfortunately, the surgeon to-day is badly equipped for such an emergency because his daily work in hospital has taught him to rely solely on the skilled anæsthetist while he is left absolutely free to concentrate his attention upon his operative work. The situation is further complicated by the fact that the unskilled anæsthetist in a country district, who may seldom have an opportunity to see a surgical operation, becomes interested in the work of the surgeon as it proceeds and his attention is diverted from the anæsthetic. Here is the strongest argument for better teaching in anæsthesia. Personally, let me record the fact that many times, while operating in the country, the writer has found the local practitioner an excellent anæsthetist, leaving nothing to be desired. Such men have been properly taught, many of them have had extensive experience, and the administration in their hands is as safe as in any other. We cannot, however, close our eyes to the fact that the reverse condition occasionally obtains, jeopardizing the situation, and possibly courting disaster. Recently the ex-president of the American Association of Anæsthetists made a strong plea for the better

teaching of anæsthesia; we emphatically endorse his opinion that adequate training is an imperative demand and should be insisted upon in all our medical schools and hospitals.

The relationship subsisting between the surgeon and the anæsthetist must vary, first, with the skill of the anæsthetist, and secondly, with the skill of the surgeon in every varying combination. There must be co-operation between the two, but the experienced anæsthetist on the one hand, and the experienced surgeon on the other, must recognize that for either of them to work with an unskilled colleague produces a situation full of difficulty and danger. The writer recalls being present at an operation on one occasion when the anæsthetic was being administered by one whose qualifications and skill were unquestioned. The surgeon, in the course of an abdominal operation, made a vigorous pull on the mesentery, the patient promptly stopped breathing, the surgeon, who was a stranger to the anæsthetist, turned to abuse the anæsthetist, failing to realize that his own rough manipulation was responsible for a reflex effect on respiration which, fortunately, was only of a temporary nature. Here was a lack of co-operation and understanding which was unpardonable. The surgeon in this particular instance was a man of wide experience, but one who had not learned the value of gentle manipulation. There are, however, incompetent persons who assay to do surgery; they are usually shrewd enough to secure a skilled anæsthetist much to the discomfort of the latter, who has an undue and unwarranted amount of responsibility thrust upon him. It thus comes about that complete and effective co-operation may fail, because of lack of skill in either the surgeon or the anæsthetist. Varying degrees and combinations may exist on occasion and the departure from the ideal may be extreme.

The trained anæsthetist and the skilled operating surgeon may effect a co-partnership which affords an opportunity for effective team work, the importance of which in attaining ideal results can hardly be exaggerated. It is this combination which may be referred to as possibly "the greatest real advance in our surgical life time." Assuming we are dealing with individuals thoroughly trained and skilled in their respective spheres we may establish conditions approaching the ideal. The anæsthetist as well as the surgeon should see the patient before operation, and they should determine the kind of anæ-

thetic to be employed and the form of administration. If a physician is interested in the case he too should be consulted. Many times valuable suggestions, possibly of vital importance, accrue from such consultations. In serious cases such consultations should be the invariable rule. The same combinations of consultants might determine the pre-operative medical treatment in preparation for the anæsthetic. It is, however, during the administration of the anæsthetic that the most important field for co-operation exists. It is of undoubted advantage that an individual surgeon should always work with the same anæsthetist or same group of anæsthetists. A sympathetic co-operation naturally results from such combinations—a co-operation which is difficult or impossible to maintain if the surgeon and anæsthetist are strangers to one another.

The anæsthetist should not have his attention diverted from his duties by the work of the surgeon: in turn the surgeon should be free to concentrate his entire attention upon the operation which is in progress. These observations are mere platitudes but they are apt. There must be complete confidence between the two principals, each of whom is engaged in work of grave responsibility. Many, in fact most, operations may proceed without any communication between the operator and the anæsthetist, but when occasion arises, due to threatening respiratory or circulatory failure, or other circumstance causing alarm in the general condition of the patient, prompt action is taken by both parties.

One need hardly examine in detail, for the purposes of this paper, the various possibilities which may lead to a critical situation during the operation, nor would we refer to the specific measures which may be undertaken in an emergency. We desire mainly to stress the fact that the situation demands the closest co-operation of the surgeon and the anæsthetist. The trouble may have arisen from the anæsthetic or it may be due to shock, hæmorrhage or other effect of the operation. Most frequently it is a combination. A consultation and a sympathetic co-operation become at once imperative. It may be wise in extreme cases to discontinue the operation if that be feasible; or special measures may be undertaken to improve the patient's condition before the operator continues his work. The main point is that the best interests of the patient are conserved if the anæsthetist and the operator, both skilled in their respective vocations, work

together with a sympathetic confidence in one another, prepared after consultation to take such steps as will insure the safety and welfare of the patient.

Lastly, one may remark that the anæsthetist should have the opportunity of following up his cases in the ward during convalescence. The remote as well as the immediate effects of the anæsthetic should alike be studied by him. Obviously an anæsthetist is handicapped in giving advice regarding the type or form of anæsthesia to be administered, unless he has studied, among other things, the remote effects which may supervene, as the result of the anæsthetic, during the period of convalescence.

To sum up one's views on this subject one may urge that an effort should be made to provide effective and thorough teaching of the subject of anæsthesia both in the undergraduate course and by post-graduate instruction. There should be an efficient and sympathetic co-operation between the surgeon and the anæsthetist: the ideal is attained when both are well trained and proceed with their work in a manner which ensures a co-ordination of harmonious and skilled treatment of the patient by both surgeon and anæsthetist during the operation.

Eighty years have passed since anæsthesia was introduced as a routine measure in surgical practice. Osler has thus described in his inimitable style the benefit conferred upon mankind by the discovery of anæsthesia:—

"At a stroke the curse of Eve was removed, that multiplied sorrow of sorrows, representing in all ages the very apotheosis of pain. The knife has been robbed of its terrors, and the hospitals are no longer the scenes of those appalling tragedies that made the stoutest quail. To-day we take for granted the silence of the operating-room, but to reach this Elysium we had to travel the slow road of laborious research, which gave us first the chemical agents; and then brave hearts had to risk reputation, and even life itself in experiments, the issue of which was for long doubtful."

Anæsthesia and antisepsis are the two outstanding discoveries of recent times. The modern technique of the operating room could not be carried out effectively if we were unable to control and abolish pain. Lister, Morton and Simpson initiated by their discoveries, an era of advance in surgery which is almost incredible. Progress, still further advance, is assured for the future in both surgery and anæsthesia, and we must work together with a fixed determination, by combined effort, to secure the maximum degree of relief for the suffering who are committed to our care.

THE MERIT SYSTEM APPLIED TO THE HOSPITAL STAFF

A PRESIDENTIAL ADDRESS

BY J. D. McEACHERN, M.D.

Winnipeg

"If anyone shall reprove me, and shall make it apparent unto me, that in any either opinion or action of mine I do err, I will most gladly retract. For it is the truth that I seek after, by which I am sure that never any man was hurt; and as sure, that he is hurt that continuith in any error, or ignorance whatsoever."

—*Marcus Aurelius.*

I HAVE chosen to address you on the above subject, firstly, because it has seemed to me that the general body of the profession might with profit increase their interest in hospital problems and, secondly, because I believe it is impossible to put the system here advocated into practice without your active support and co-operation.

Some form of merit system has existed in business, in industry and in athletics for ages. Business must be run at a profit or it ceases to exist. The manager who fails to make his department pay must be supplanted by one who will. The manufacturer must produce and sell his product at a profit, or his plant must close down. These may seem hard inexorable laws but they make for efficiency in business and industry and thus work out to the benefit of society. Nowhere is the merit system more strictly applied than in athletics. If an athlete is to represent his school in the hundred yard dash, the main essential is that he be able to run that distance faster than any other pupil in the school. Nature herself produces her best forms by free competition with the survival of the fittest. There seems to be no good reason why a system which has worked so well when applied to business, to industry, to athletics, and is a part of the great plan of nature itself, should not work well also if applied to the medical staff of a hospital. Before we can determine what is meritorious in a member of the medical staff of a hospital, we must first have clearly in mind the functions and duties of such a staff. These I conceive to fall mainly under three headings, as follows:

1. The diagnosis and treatment of disease.
2. The advancement of medical knowledge.
3. The function of teaching.

* Delivered before the Winnipeg Medical Society, May 20, 1927.

THE DIAGNOSIS AND TREATMENT OF DISEASE

In order that this function may be properly performed it is necessary that the hospital be staffed with competent men. We have therefore to consider the question of the qualification necessary for each post.

The various departments of a general hospital fall under the heads of the several specialties. The qualifications, therefore, for appointment to the staff of any particular department, should be the qualifications required of a specialist in that branch of medicine. The 1921 report of the Committee of the American Medical Association, on Graduate Medical Instruction, has set out what it considered to be the minimum amount of time required to insure efficiency in the various specialties. In the main they advocated from two to three years' training after the student had completed a year of internship in a general hospital. While this guide is useful in judging the qualifications of those who have recently entered the ranks of the specialties, it cannot be used as a standard to measure the qualifications of the older specialists who did not have at their disposal the easy roads to post-graduate study that exist to-day, but who, largely by their own efforts, have made themselves competent in their respective fields. Yet, however much we may admire these older men, we must recognize that that method of training specialists belongs to a day that is past. The modern surgeon cannot hope to fit himself for his work by reading surgery from a text book, and to obtain his practical training by operating on what cases he gets from his private practice. He must expect to spend a long period of time in hospital work under the guidance of competent men, or to serve an adequate apprenticeship with an experienced surgeon; and likewise with the other specialties similar training is essential.

We hear much to-day of the menace of the improperly trained specialist, but few seem to recognize the part played by the hospital in lowering the standard of specialism, by attaching men to their special departments who have but

meagre qualifications for the work undertaken by that department, and who are unwilling to make the necessary sacrifice in time and money to properly qualify themselves for that work. If, in future, every member who joined the staff of a hospital did so on the understanding that he was going to make the work of the department to which he became attached his life work, and was required to limit his work to his specialty by the time he reached the age of forty, such a measure would increase the efficiency of hospital staffs, and would improve the treatment which hospital patients receive. When we have succeeded in staffing the hospital with men well trained in diagnosis and treatment, our task is by no means ended, for the merit system implies that their tenure of office must depend on their efficiency being maintained.

The results which they obtain by means of their special knowledge and opportunities must be open to critical appraisal at all times. The open review of cases, as required by the minimum standard of the American College of Surgeons, is a most important factor in keeping the members of hospital staffs from going to seed. If such a highly organized, privately managed institution as the Mayo Clinic, finds it necessary, in order to maintain efficiency, to review its cases, the honorary attending staffs of hospitals managed by lay boards of directors, can scarcely afford to overlook this means of stimulating good work in their ranks. Good work has nothing to fear from the open review of cases, while the condoning of incompetent work spells disaster for the patient. The results of these reviews of the work of the staff forms one index to the efficiency of individual members.

Again, the standard of work done by the staff of any particular department will be greatly influenced by the calibre of the head of that department. First, he must have a thorough knowledge of his work. Some years ago I heard W. J. Mayo make the following statement: "The surgeon who knows only the common things in surgery, does not know the common things well." Increasing experience has impressed upon me the truth of that statement. No doubt it applies with equal force to the other departments of medicine also. He must be able to make practical application of his knowledge and not be one "who looks through the eyes of the dead and feeds on the spectres in books." He should have proven himself capable of adding to medical knowledge, otherwise he cannot with

confidence be expected to see opportunities for clinical investigation, nor has he the experience necessary to direct such studies. He should have the discrimination to recognize merit in those beneath him and the generosity to give that merit opportunity. He should be a man of high ideals. "Blessed," says Pasteur, "is he who carries within himself a God, as an ideal, and who obeys it; an ideal of art, an ideal of science, an ideal of the gospel virtues; therein lies the springs of great thought and great actions; they all reflect light from the infinite."

Having all these qualifications, he may still fail, if he does not get sufficient support from his associates, from his Board of Directors and from the general profession to put his ideas into action. Given, then, a staff chosen for its high standard of training, kept keen by the gentle friction of staff meetings openly and freely conducted, and stimulated by the example of chiefs of departments of acknowledged ability, one may hope that the staff functions of diagnosis and treatment may be fully and properly exercised.

THE ADVANCEMENT OF MEDICAL KNOWLEDGE

Osler frequently pointed out, that it was the duty of every physician to contribute, in so far as he was able, to that great storehouse of medical knowledge upon which he so largely draws. If this be the duty of the ordinary physician, how much more is it the duty of one who is a member of a hospital staff, having at his disposal the complete organization, with its laboratory and consultation facilities, which the modern hospital provides. If we fail in this duty, we are but parasites that feed upon the stores laid up by others, giving or producing nothing ourselves. These contributions to the general store of medical knowledge the members of the hospital staff will offer to the profession by articles published in good medical journals.

In addition to this duty to the general profession we are also under obligation to the local practitioners. It is obvious, that were there no free clinics all patients now treated by the staffs of these clinics would be under the care of private physicians, who would then have the opportunity of benefiting from this additional experience. These free clinic patients are, in effect, taken out of the hands of the profession at large and placed in the care of hospital staffs. It is the plain duty of the members of such staffs to study carefully these cases entrusted to them, and give

the local members outside their ranks the benefit of their experience. This they will do by making worth-while contributions to the programmes of hospital and society meetings.

These contributions to medical literature and to society and staff meetings provide another means of measuring merit in individual members.

THE FUNCTION OF TEACHING

On account of lack of time, the teaching of nurses, and the instruction of patients and the public in matters of health must be left out of this discussion. Only the responsibility of the medical staff in the teaching of medical students will be considered.

It has been said that Epictetus when asked what were the requirements for the establishment of a school of philosophy, replied as follows: "To establish a school of philosophy one requires a philosopher and a pupil." When asked what material equipment would be necessary he said: "A pencil and some scraps of paper might be provided."

Admitting the greater requirements in material equipment, it is just as true of the school of medicine as it is of the school of philosophy, that the main factors in success are, and always will be, the teachers and the pupils. During recent years we have seen a great increase in the material equipment of our medical schools and hospitals. While this has resulted in increasing the efficiency of these institutions, there is some danger that too much emphasis may be placed on equipment and not enough on the quality of the teachers. Furnishings of hospital wards and laboratories, important though they may be, are but the tools of the teacher and surely the workman is greater than his tools.

It will be noted that Epictetus, when speaking of the requirements of a school of philosophy, put as his first requirement, not a *teacher of philosophy* but a *philosopher*—a man not only well grounded in the principles of philosophy but one able to make practical application of these principles. In the teaching of medicine also, a man cannot be a good teacher unless he be a good practitioner. Few ideas are more fallacious than the one that the entertaining lecturer is necessarily a good clinical teacher. The good lecturer and poor practitioner will fail, for good admonition and bad example builds with one hand and destroys with the other.

In Manitoba the medical student is required to spend the final year of his course in hospital.

Wherever we have a practitioner and an interne, then we have the Epictetan conception of the essentials of a school. For material equipment we need mainly a few patients. Let us take the interne as representative of the medical student in the hospital and ask ourselves what our duties are in teaching him. The interne is learning to become a practitioner; this he does by practising. In other words, he learns to do by doing. He learns to diagnose by making diagnoses. It is even said that we learn to think by thinking, though the amount of independent thought required by the average interne is scarcely enough to give his brain cells their "daily dozen." In all his cases therefore the interne should take his own history, make his own physical examination, carry out the simpler laboratory tests necessary and finally arrive at his own diagnosis. After this has been done in a thorough manner, the staff teacher should go over the case with him, call his attention to points he may have overlooked in the history, help him to interpret the physical signs, and, if the case is not clear, suggest to him what course his further investigation should take. The diagnosis made, the interne should work out his own treatment, which should again be checked over with the staff teacher. The interne should follow the case to watch the progress of the disease, and to observe the results of treatment, making notes of his findings from time to time. The interne should be taught the use of his text-book, and in so far as possible the door of medical literature be opened to him. It is the teacher's duty to place the tools in the hands of his assistant and guide his early endeavours; in short, to teach him how to carry on the practice of medicine. It is not his duty to do anything for him that he can do for himself. Every medical student should learn from his work in the hospital, if he has not learned it before, that the knowledge which is power comes only from hard and sustained effort.

No one, I think, would contend that any student could learn or be taught all that is known of the science and art of medicine during his undergraduate course. His education must be a life long process. The greatest teacher is the one who stirs up in the pupil the desire to increase his knowledge, and teaches him methods for so doing. It is essential that the teacher be a good practitioner himself. If he be careless, indifferent and incompetent in his own work, the student will consciously or unconsciously be in-

fluenced in spite of any abilities his tutor may possess as an orator.

The manner in which the staff member performs his duties as a teacher, and his influence for good or ill on his students and associates, forms an important basis on which to compute his merit as a member of the hospital team.

Having in mind the duties and functions of the medical staff of a hospital, as above indicated, it should not be difficult to determine what constitutes merit in any member of such a staff.

The following practical suggestions are offered as an aid toward making the merit system effective.

1. A statement of the qualifications demanded should accompany and be a part of the advertisement calling for applications for positions on hospital staffs.

Such a statement of requirements would force hospital authorities to come to some conclusion in their own minds as to what they are prepared to accept as qualifications for the various positions. It cannot cover every detail, but should set forth the essentials in a broad way. The applicant would then submit a record of his undergraduate and post-graduate training, his published papers and any worth while contribution he had made to the activities of medical societies. These, with a consideration of his ethical and moral standing and his ability to co-operate with his associates, would form the basis for selection. Such a plan would uphold the arms of the staff should they meet with any obstruction from their Board of Directors in making just selections. It would also announce to the young man beginning his career the fact that if he hoped to obtain a position on a hospital staff he would have to provide himself with the necessary professional qualifications; this in contra-distinction to the "personal" method of making appointments, which frequently leads the young man to think that professional qualifications are secondary to "pull."

2. That a yearly report be submitted to the Board of Directors by the heads of departments covering the clinical work of the department during the year.

Such a report would contain a record of all clinical investigations made by members of the staff during the year, with results; all papers published by the staff members during the year and all worth while contributions to the activities of medical societies and staff meetings.

This report should be available to all members of the profession on payment of the cost of printing.

3. That the heads of the two main departments in the medical school, namely, medicine and surgery, be put on a full time basis.

The efficient organization and management of these departments requires a great expenditure of time and energy, and it is unfair to expect men to neglect the private practice by which they live, to do the work of the university without adequate remuneration. Moreover, the heads of these departments should have a great deal to do with the selection of the men on their staffs, and human nature being what it is, it is essential to impartial selection that they be removed from the ranks of competitors.

4. Representation of the organized profession on the council of the medical faculty of the university and on the advisory committees of hospitals.

It seems to me that the progress of our different organizations is hampered by a lack of understanding of each other's aims and problems, and by a lack of that sympathy and co-operation which follows such understanding. Such direct representation of the organized profession on the organizations of the medical school and hospitals would, in my opinion, facilitate the work of all, for I believe that with full understanding our aims are not divergent but parallel.

The merit system, as I see it, has the following advantages:—

It will work out greatly to the advantage of the patient, which we are wont to state upon occasion is our chief concern.

It is the *only* system which is in accord with the ideals and ethics which we profess to follow.

Its adoption and impartial application will greatly elevate the tone of the whole profession.

It appeals to the true sportsman, for it represents in medical practice what would be described in sport as, "a fair field, no favours, and may the best man win."

I am aware that such a system may be considered by some, to be idealistic and unpractical. I am not blind to the difficulties that lie in the way of putting it into practice and recognize that much water must run under the bridge before anything approaching ideal conditions can obtain. We should recognize that the performance of these duties of the medical staff of a hospital is the root and branch of medical ethics as far as the members of such a staff are concerned. Though we may not attain perfection, yet must

we continue the struggle for improvement. It is in the nature of man to progress. The courageous man lives in conformity with his nature, and supports that which is higher. Men with freedom of thought and spirit will continue to come forward in the future as they have in the past to lighten the burdens of false standards, of prejudice, and of sentimentalism which still weigh heavily upon us. Though we have made good progress, much remains to be done, and we still have need of some of the old pagan virtues. "Would you return good for evil?" asked a pupil of Confucius. To which that great thinker replied, "With what then would you recompense good. Return good for good, and

for evil, justice." In addition to doing justly, let us light our tapers at the Promethean fire, which burned so strongly in the hearts of Osler, of Lister and Pasteur, and in the hearts of countless others in our ranks upon whom the mantle of fame has never descended. The spirit which animated them is not dead for it comes as truly out of the heart of nature as the law of gravity or the law of self preservation. It is the spirit which Tennyson recognized in the divine Ulysses, urging him "to follow knowledge like a sinking star, beyond the utmost bounds of human thought," and which, in his old age, bent but not broken with the storms of life, upheld him still, "to strive, to seek, to find and not to yield."

ACUTE NEPHRITIS IN CHILDREN*

BY GLADYS L. BOYD, M.D. (TOR.)

THE following study is based on observations made on one hundred and fifty patients with acute nephritis admitted to the wards of the Hospital for Sick Children, Toronto, between 1920 and 1926. In addition to the observations made on the ward these patients have been studied for a period of two to five years in the out patient department of the hospital. Most were subjected to a fairly complete functional study while in-patients, and wherever feasible such tests have been repeated at intervals subsequently.

It has ever been the hope of students of renal disease to discover a classification of the disease which would satisfy at one time both clinician and pathologist, but complete success has rewarded no one as yet. The following classification is the one we have adopted as being the simplest clinically and showing agreement with the pathological diagnosis in most instances.

1. Acute hæmorrhagic nephritis (also known as acute glomerulonephritis).
2. Acute tubular or hydræmic nephritis (also known as acute exudative, acute parenchymatous, or nephrosis).
3. Mixed type or acute glomerulo-tubular

nephritis, or diffuse glomerulo-tubular nephritis.

4. Febrile albuminuria.
5. Acute syphilitic nephritis.

1. Acute hæmorrhagic nephritis is considered by most observers as the commonest type of nephritis seen in childhood. Formerly the predominance of this type was also noted in the cases coming to the Hospital for Sick Children for treatment. During the past five years an increasingly large proportion of our cases have been of the *hydræmic* or *mixed* type. Only little better than a third of the series discussed in this paper could be classified as of the acute hæmorrhagic type. Typically, the history of patients with acute hæmorrhagic nephritis is that of an acute upper respiratory infection succeeded after a partial recovery by urinary symptoms such as hæmaturia and more or less suppression of urine. Less frequently the onset of an infection and of renal symptoms are coincident. In others, uræmic symptoms, such as vomiting, headache, stupor and convulsions, are the first evidence of nephritis. Œdema is usually entirely absent or limited to puffiness about the eyes and ankles. Curiously enough, this puffiness about the eyes is often complained of for months after the subsidence of all acute symptoms. Gross hæmaturia and the presence of small amounts of albumin, usually 0.1% or less, are the most characteristic

* From the Laboratories, Sub-Department of Pædiatrics, University of Toronto and from the wards and laboratories of the Hospital for Sick Children, Toronto, under the direction of Alan Brown, M.B.

findings in the urine. The microscope usually fails to reveal any other finding than large numbers of blood cells, unless these are laked by adding water when a few granular casts and large mononuclear cells are seen. Blood casts are infrequently noted. The gross hæmaturia usually lasts from one day to a week, but occasionally persists for weeks, or even months, producing a secondary anæmia of a severity proportional to the amount of blood lost through the kidney. Return of gross blood in the urine after its disappearance is readily caused by such things as tonsil operations, too early addition of salt to the diet, infections of the intravenous injection of phenolsulphonephthalein.

2. Acute hydræmic nephritis is characterized clinically by the marked and often persistent œdema and ascites and by the intensity of the albuminuria. The onset of symptoms may follow an acute infection but more frequently these develop insidiously over a period of weeks. Advice is usually sought because of the œdema. The urine is small in amount and "boils solid." The amount of albumin present is often as much as 1.5 to 2.5% of the urine. Gross blood is not found, but a few red blood cells may be seen under the microscope. Pus is present in some cases in which the nephritis is associated with a *B. coli* urinary infection. Casts vary both in regard to number and character. At times none at all are present, while at other times they are fairly numerous, both of the granular and hyaline type, the latter usually predominating.

The tendency to become chronic is a little greater in these cases, and even in those patients who ultimately recover completely, convalescence is slower. Death during the course of the illness is more frequent, due to the hypersusceptibility of these children to infection rather than to kidney failure.

3. The mixed type or diffuse glomerulo-nephritis is becoming relatively much more frequent than formerly. These patients present the combined symptoms of the other types; either may predominate, but both are present in sufficient degree to justify the diagnosis of a diffuse lesion. The onset is usually subsequent to an infection, the hæmaturic symptoms appearing first and œdema developing later. When this order is reversed, the pathological condition usually proves to be not an acute glomerulo-tubular nephritis but a chronic tubular lesion with an acute glomerulo-nephritis superimposed. Both the immediate and ultimate prognoses are

worse. Complete recovery is possible, in fact did occur in about 40 per cent of such cases in our series, but the tendency to the development of chronic interstitial nephritis or to death from renal failure is marked.

4. Febrile albuminuria has been accorded a separate place in the classification because of its clinical course rather than its pathology. Albumin is frequently noted when routine urinalyses are done in patients suffering from acute infections and presenting no symptoms of nephritis. Casts and a few blood cells may be also present. As the infection subsides the urine clears up, and the findings are considered of little or no significance. When the infection proves fatal, the kidney is found to be the seat of a benign type of acute glomerulo-nephritis. Similar urinary findings are seen also in the acute intoxications of childhood, such as intestinal intoxication, acidosis or diphtheria. The proximal convoluted tubules are the seat of degenerative changes in such cases. The significance of these transitory urinary findings is doubtful, but it is possible they may be responsible for the chronic changes noted in many kidneys which from the clinical history of the patient are suffering from their initial attack of nephritis.

5. Acute syphilitic nephritis is not common but merits attention because of its clinical similarity to acute tubular nephritis and its invariably fatal outcome. Five such infants are included in the present series. Œdema developed rapidly and more or less hæmaturia was noted. The spleen was enlarged in all cases, but other specific lesions were absent save in one case in which a specific rash was present. Suspicions as to the nature of the case is aroused by the splenic enlargement, and confirmed when blood is withdrawn for a Wassermann. The serum is "milkier" than in any other cases we have seen in children. The urine contains much albumin, few casts and occasional red blood cells. Peculiar lipid substances may also appear in the urine as doubly refractile bodies. Any treatment seems of little avail and at autopsy specific changes are widely distributed in other organs as well as in the tubules of the kidney.

ETIOLOGY

The relationship between an acute upper respiratory infection and acute hæmorrhagic nephritis is too close to be of no significance. The type of infection is usually one of those attributable to the hæmolytic streptococcus, *viz.*, tonsillitis,

otitis media or cervical adenitis, but in seventy-five throat cultures in acute hæmorrhagic nephritis we were only able to isolate this organism in a small percentage of cases. Further, of this small proportion so many were associated with positive blood cultures of so serious a nature that we were inclined to regard their findings as of bad omen. Urinary cultures were negative for this organism in all but two cases which had positive blood cultures. Although organisms were not found in the urine except in pyuria in which *B. coli* was present in fifty per cent of the cases.

The constancy of the association of infection with the development of hydræmic cases was not so plainly evident. Marriott¹ has suggested nasal sinusitis as the likely source of infection. In our earlier cases adequate research for such foci was not made, but the greater care exercised in looking for such foci in later cases has not been productive of many positive findings. Staphylococci or pneumococci have not been found in such cases with any degree of regularity. One fact in the past history of hydræmic nephritis has impressed us, namely, the almost constant presence of measles. Typical nephritis following immediately after measles is relatively rare, but many patients with this infection do have so-called febrile albuminuria and it is quite possible, as pointed out above, that a subacute process is initiated at the time which subsequently becomes of enough significance to produce hydræmic nephritis. Two recent autopsies on measles patients, one with obvious renal disease, the other with none, have shown definite pathological changes in their renal tubules resembling those usually found in hydræmic nephritis. Another fact we have noted in these patients is the frequency with which the tuberculin skin tests are positive. Whether tuberculous infection is of any significance in the etiology of the disease, or its frequency is merely due to the general lowered resistance of these patients to infection we are not prepared to state.

Acute mixed nephritis is usually consequent upon an upper respiratory infection but no peculiarity, bacteriologically or clinically, in the nature of the infection responsible is evident as yet.

PATHOLOGY

Clear-cut, well-defined lesions confined to one or other structure of the kidney are about as rare in the nephritis of childhood as in that of adults. It is, however, possible to predict fairly

accurately from the clinical type of disease in which unit of the kidney the major portion of the damage will be found. Thus, in acute hæmorrhagic nephritis, the inflamed glomeruli stand out as minute red points in a kidney itself somewhat redder than usual. Microscopically, these are seen to be the site of an inflammatory reaction either intracapillary or extracapillary in type. The tubules, however, are not usually intact, but more especially in their proximal convoluted portions show changes, varying from swelling to advanced stages of degeneration, and at times even cellular infiltration. The glomerulitis is so much the outstanding feature that it is rightly considered the lesion of hæmorrhagic nephritis. It might be added that hæmorrhagic nephritis is not always the clinical manifestation of an acute glomerulitis, as the latter even in fairly widespread form is sometimes seen at autopsy without having caused sufficient symptoms during life to indicate a renal lesion.

In hydræmic nephritis the picture is entirely different. The kidney is usually larger and paler than normal. Microscopically, widespread changes are seen in both proximal and distal portions of the tubules. These are most frequently degenerative and of a fatty nature. Interstitial round celled infiltration is sometimes present. Glomerular changes are slight and degenerative in type, varying from cloudy swelling to loss of differentiation of the loops of the tuft or alteration in staining properties of the cells and disappearance of their nuclei. As Dyke² points out, the severity of glomerular changes seems to distinguish between those cases with much œdema and no hæmaturia, the acute hydræmic cases, and those in which both were present. In the latter, acute mixed nephritis, glomerular changes of an inflammatory nature similar to those described in acute hæmorrhagic nephritis were combined with widespread tubular changes. When the œdema has antedated the hæmaturia for some weeks, the tubular changes are chronic in nature, while the glomerular are acute. Round celled infiltration is frequently seen in the interstitial tissue. The extensive involvement of all parts of the kidney in this type of nephritis makes its progressive nature readily comprehensible; indeed, one wonders why recoveries ever occur.

The kidneys in syphilitic nephritis resemble most closely those of acute hydræmic nephritis. They are pale, slightly swollen and cut with some resistance. The tubular degeneration is general

and markedly fatty. Lymphocytic infiltration is probably a little more marked than in ordinary cases, and inflammatory changes in the glomeruli less marked than the degree of hæmaturia present leads one to expect.

BLOOD PRESSURE, FUNCTIONAL TESTS, ETC.

Blood pressure determinations provide one of the simplest means of obtaining valuable information concerning both the immediate and ultimate outcome in acute nephritis. A steady rise in the acute stage is indicative of increasing intracranial pressure, and unless checked, cerebral symptoms due to the latter soon develop. In such cases both diastolic and systolic pressures are increased and the increase in pulse pressure due to the fall of the former may be the first sign of improvement. The magnitude of the rise in systolic pressure does not seem to differentiate between true uræmia and pseudo-uræmia. Heights of 200 mm. or more occurred in both types. Systolic pressures of 120-130 mm. are common in the acute stage of non-uræmic cases of hæmorrhagic type, and are of little significance. Persistence of such elevations after clinical recovery signifies the presence of a progressive renal lesion.

Nitrogen retention as evidenced by an increase in blood non-protein nitrogen occurs in all types of nephritis, but is more constantly present in those cases in which hæmaturia occurs. Values of 40-50 mgm. per 100 c.c. of blood are common at the height of the disease in most hæmorrhagic cases and when transitory are not of much importance. Their persistence after the abatement of acute symptoms is more serious. There is always an increase in the blood non-protein nitrogen in those cases with more or less suppression of urine, but such increases are not always commensurate with the degree of suppression nor does a fall always occur coincident with the outset of diuresis. The chief value attained by a determination of the non-protein nitrogen is in differentiating between true uræmia due to nitrogen retention, and pseudo-uræmia due to increased intracranial pressure and not associated with any marked degree of nitrogen retention.

The determination of creatinine possibly furnishes a more reliable guide in making the prognosis in nephritis than does any other single constituent of the blood. When blood creatinine does not exceed 4 mgm. per 100 c.c. complete recovery may occur. A progressive chronic lesion is usually present when between 4 and 5 mgm.

are present, while when more than 5 mgm. are found, death occurs within a few months. Values of 10 or over in acute nephritis are only found when death is imminent. As pointed out in a recent paper³ high blood phosphates, in the absence of acidosis have the same significance as high creatinine, and when both are high justify one in making a bad prognosis regardless of the clinical condition of the patient in which they are found.

The most valuable functional tests are the simplest, such as the concentration, water and phenolsulphonephthalein. None of these require elaborate apparatus nor technique and can readily be done in the home. No functional study should be made until after the acute symptoms have subsided. They only measure the reserve power of the kidney which is decreased temporarily in practically all cases of acute nephritis.

The technique of doing these tests and the normal response to them have been given in a previous paper⁴. A normal response to the concentration test is practically never seen in cases in which complete recovery is not the result. Inability to concentrate whether it is evidenced by the low specific gravity of the night urine only, or by its fixation during the 24 hours justifies the promise of an incomplete recovery. When the specific gravity of the night urine is constantly below 1,020, the disease becomes chronic.

Normal responses to the water test are encountered in all types of nephritis irrespective of their type or outcome. When chronicity is associated with a normal response, it is usually of the benign type where persistent albumin but no clinical symptoms are present. Slight impairment of water excreting or diluting power of the kidney is apparently of no prognostic importance. Gross impairment is incompatible with a complete cure.

The phenolsulphonephthalein test varies so widely without significance that we consider it only of value in conjunction with other tests, or when its excretion is markedly impaired. In patients who excreted 20 per cent, or less, within 2 hours, death occurred shortly after in 66 per cent and the remainder all developed chronic lesions of a severe type.

PROGNOSIS

A fairly accurate prognosis can be given in acute nephritis in childhood. It depends on the

five factors discussed below in order of their relative importance.

1. The type of nephritis, as indicated in the chart of the results in the cases of this series, is most important.

	<i>Cured</i>	<i>Chronic</i>	<i>Died</i>
Acute hæmorrhagic . . .	72%	16%	12%
Acute hydræmic	55%	21%	24%
Acute mixed	41%	40%	19%
Acute syphilitic	0%	0%	100%

Acute hæmorrhagic nephritis offers a considerably better hope of complete recovery than do other types. This difference is probably greater than the chart indicates for the majority of such cases classified as becoming chronic made complete clinical recoveries and the only sign of chronicity was the persistence of traces of albumin in the urine, with or without casts. Chronicity in the other types means persistence of both clinical and urinary signs of renal disease, often obviously progressive in nature. Death in the hæmorrhagic type was the result of the causative infection or uræmia, in about equal proportions. In the hydræmic type, a fatal outcome is usually the result of intercurrent infection and is much less often of renal origin.

2. The age of the patient has an important bearing on prognosis, particularly in hydræmic types. In infants suffering from even extreme grades of the latter, recovery occurs in practically 100 per cent of cases, whereas in older children a much greater tendency to chronicity is noted.

3. Functional tests and blood pressure determinations are both valuable aids in making a prognosis. A rapidly rising systolic pressure warns of the onset of uræmia, and its subsequent fall after the institution of treatment is the best indication of the effectiveness of the latter. Persistence of moderate elevations after recovery from the acute symptoms indicates chronicity. The help given by functional studies has been discussed under that heading. Suffice it to state here, that persistent retention of nitrogenous end products, or poor response to renal tests warrants a bad prognosis as to chronicity or death, regardless of the clinical conditions of the patient.

4. The readiness with which focal infections can be removed undoubtedly plays a role in determining the outcome. It is believed by many that removal of foci is less important because less productive of favourable results in hydræmic nephritis. It would appear rather that the type of infection causing such lesions is of a

more obscure nature and less readily amenable to removal than the almost universally infected teeth or tonsils of hæmorrhagic nephritis.

5. Lastly, the degree of co-operation in the care of the child given by the parents often determines whether or no the issue will be successful or not. Treatment is often long and tedious, and, judged by the patient's clinical condition, unnecessarily strict. Patients are consequently allowed up before adequate rest has been given with usually disastrous results to any hope of complete cure.

TREATMENT

Treatment may be discussed as first those therapeutic measures necessary in all cases of nephritis, and secondly those demanded by the presence of specific symptoms. Three main indications must be met in treating all cases: (1) Adequate rest; (2) suitable diet; and (3) removal of foci of infection.

Rest in bed is necessary in all types of nephritis until all acute symptoms and all signs of the disease have disappeared. This sometimes requires months during a large part of which time the patient feels so well that he is only with difficulty kept at rest, and the only evidence of nephritis may be the persistence of albuminuria. Failure to enforce this prolonged rest is only justified when from the study of the case, both clinically and functionally, one feels certain that complete cure is unattainable, and albumin will persist permanently. Too often the child is allowed up when partially cured only to suffer a relapse so readily produced in a recently inflamed kidney by exposure to cold, damp or infection, and his acute renal lesion is thereby converted into a chronic one. A degree of functional rest for the kidney is attained, particularly in the acute stage, by utilizing other channels or excretion such as the bowel and skin. Saline cathartics sufficient to secure free evacuation of the bowel should be given daily. The skin should be cleansed by frequent bathing. Hot packs do help enough to justify their use.

Complete rest cannot be secured for the kidney by any type of diet; none the less, certain restrictions must be imposed because certain foods require more work by the kidney for their excretion, and others prove irritating to it. Proteins are the chief offenders in producing extra work and have in consequence usually been restricted in nephritic diets. No evidence has been adduced to show that an intake of protein adequate

to meet the patient's requirement is harmful to the kidney, and restriction below this level is injurious to the individual. Salt and foods producing an acid ash are the articles contraindicated, because of their irritating properties. The former has long been excluded in most diets because of this, and its tendency to produce oedema. The recognition of the deleterious effect on the kidney of excreting excessive acids when foods producing acid ash are used has been more recent. Sansum and his co-workers⁵ suggested the use of base forming diets in the treatment of nephritis, because of the known injurious effect of acids on living tissues. Lists of foods with their acid or base forming properties have been given by Sherman and Gettler⁶. Briefly stated, fruits, vegetables and milk are the base forming foods and as such should predominate in nephritic diets. Animal protein diets such as meat, fish and eggs are strongly acid producing, and to a less extent all grains belong to this group. Foods such as corn starch, syrup and butter are neutral in this respect. Diets in which base forming foods predominate will necessarily contain abundant vitamins, adequate mineral matter and sufficient bulk. Such diets have been used in the Hospital for Sick Children during the past two years.

During the acute stage of the disease an exclusive milk diet giving 1,200-1,600 c.c. milk daily is best in most cases. The exceptions are met in children with an accompanying acidosis and vomiting when orange juice and glucose solution are best, and in hydræmic nephritis in infancy, when protein milk proves most effective. Milk diets are usually only needed for from three to ten days, at which time the more acute symptoms have gone and salt free fruits and vegetables may be added to the milk diet. This diet is adequate until all but traces of albumin have gone from the urine, or the disease has apparently become chronic. So-called full diet is then started. This is a salt free diet of which the large proportion is made up of base forming foods, such as milk, fruit and vegetables. Sufficient protein in the form of meat or eggs is added to bring the protein content up to 40-60 grms. depending on the child's age. Acid forming foods such as bread and cereals are restricted to small amounts. With this precaution it is not necessary to use salt free bread, which is usually unpalatable, as the small amount of bread used does not involve the use of appreciable amounts of salt. Salt free butter is advised, particularly if there has been any oedema. Such diets are to be used for months

after recovery and then a gradual return to ordinary diets is permitted.

Whatever may ultimately prove to be the effect of basic diets on the kidney, the evidence points to their being less irritating to the kidney and the recovery of normal health quicker and more easily maintained when they are used. It is possible that the salutary effect of green vegetables in protecting the kidneys of rabbits fed on high protein diets noted by McLean⁷ rather than the production of a bland urine is the explanation of the beneficial effects of these diets.

Too much stress cannot be laid on the importance of the search for and removal of focal infections early in the course of the disease. Such care often determines the ultimate outcome. Diseased tonsils and teeth are the most frequent sources of infection, particularly in the hæmorrhagic types. Their removal in hydræmic nephritis is not always followed by such striking benefit. This does not contraindicate their removal, but suggests further search for more obscure foci, such as infected sinuses and their eradication when possible.

Oedema is one of the frequent and often troublesome symptoms to treat. *Ordinary diuretics are contraindicated because of their irritative effect on the kidney.* Those drugs having the maximum effect on the hydropic condition of the patient and producing the minimal degree of renal irritation such as the chloride and lactate of calcium and ammonium chloride are indicated. We⁴ have previously pointed out the beneficial effects obtained in most cases by the administration of large doses, 15-30 grains, of either calcium chloride or lactate. The only objection to these drugs is their nauseating taste and consequent difficulty in getting the child to take them in adequate quantities. Ammonium chloride is at once a more potent and less irritating salt. It is given in 15-30 grain doses, two or three times daily, depending on the age of the child and the degree of oedema present. Very few patients fail to respond to the administration of this drug, by the onset of diuresis and the disappearance of oedema. It need only be given for three or four days, as by then it will usually have proven effectual. In the small number of cases who do not respond by this time, beneficial results are usually produced by the exhibition of calcium salts. Sufficient 50 per cent magnesium sulphate solution should be given each morning to produce free evacuation of the bowels. Fluid intake need not be greatly restricted as the beneficial effects

fluids produce are more striking than are any of the ill effects which follow their ingestion. Hot packs are of little use in the treatment of oedema and their continued use often has a depressant effect.

Anuria demands no special treatment unless complicated by uræmia or persisting longer than twenty-four hours. Ammonium chloride, as given for oedema, is a safe and usually effectual remedy. Local hot packs over the kidneys and bladder are of some help. Should there be no secretion of urine after a day of this treatment, hypertonic glucose, 20 per cent should be given intravenously. Two to three hundred c.c. is usually adequate. The ammonium chloride should also be given. If all these measures fail and after four or five days renal function is still in abeyance an exsanguination transfusion is indicated. The latter generally proves efficacious but should only be resorted to when other measures have failed. Its usefulness is thereby limited to a very small number of cases.

Secondary anæmia is a constant complication of nephritis. When severe it is best treated by a simple transfusion. This procedure has proven necessary in a much smaller number of patients since we have used the diets described previously. Possibly their content of vitamine E is sufficient to enable these children to make more effective use of the iron tonic usually prescribed for them.

Uræmic symptoms may complicate any type of acute nephritis and may occur at any stage of the disease. They consist of persistent vomiting, high or rapidly rising blood pressure, headaches, visual disturbances, drowsiness, convulsions and coma. Such symptoms may be due to true uræmia with nitrogen retention, or to oedema of the brain and consequently increased intracranial pressure with little or no nitrogen retention. The latter cause is more common in acute nephritis. Treatment is given according to the variety present.

There is no specific treatment for true uræmia. Symptomatic treatment to allay the nervous symptoms is indicated. Repeated hot packs are useful. If convulsions are present, lumbar puncture often affords some relief. If this proves inadequate, 8 per cent magnesium sulphate subcutaneously or bromide and chloral by rectum may be given. Bleeding is usually ineffectual because sufficient blood cannot be withdrawn quickly. Removing blood by means of a syringe and replacing it with a small quantity from a

suitable donor is sometimes a successful procedure in urgent cases.

Therapeutic measures in the pseudo-uræmia caused by oedema of the brain are usually more effectual. The indication for treatment is to reduce the cerebral pressure by decreasing the oedema. Two methods are in use to effect this. The first is to reduce cerebral pressure by lumbar puncture and at the same time give ammonium chloride as a diuretic and 50 per cent magnesium sulphate solution as a purgative. This method is usually effectual in relieving the symptoms, but there is some degree of danger of producing impaction of the medulla if care is not exercised in doing the lumbar puncture. The second method is that outlined by Blackfan⁸. It consists in the cautious intravenous injection of 1 per cent magnesium sulphate together with the administration of a 50 per cent solution of the salt by mouth and by rectum. The injection should not proceed faster than at a rate of 2 c.c. per minute. The respirations must be watched and any irregularity necessitates the immediate cessation of the procedure. If the rate indicated is not exceeded such irregularities seldom occur. Not more than 10 c.c. per kilo of body weight should be given. An ounce of 50 per cent solution of magnesium sulphate by mouth and 2-3 ounces by rectum should be given every 4-6 hours until the symptoms are relieved. The blood pressure, often after a temporary rise, falls consistently for some hours. The injection may need to be repeated in 10-12 hours, however, because of its tendency to rise again. Convulsions and vomiting usually cease immediately, sometimes independently, of the fall in blood pressure. This latter fact makes it appear as if at least in some cases the magnesium acted as a sedative rather than as a hypertonic solution as suggested by Blackfan.

SUMMARY

A study of acute nephritis in childhood based on 150 cases treated in the Hospital for Sick Children, Toronto, is presented. A simple classification is offered. Conclusions regarding the etiology and functional pathology of acute nephritis in children are given. The treatment of disease and its complications considered most satisfactory is outlined.

REFERENCES

1. MARRIOTT, W. McK., *Am. J. Dis. Child.*, 1924, xxix, 578.
2. DYKE, *Quart. J. Med.*, 1924, xviii, No. 69, p. 77.

3. BOYD, G. L., COURTNEY, A. M., AND MACLACHLAN, I. F., *Am. J. Dis. Child.*, 1926, xxxii, p. 29.
4. BOYD, G. L., *Am. J. Dis. Child.*, 1922, xxiii, p. 375.
5. SANSUM, W. D., BLATHERWICK, N. R., AND SMITH, F., *Am. Med. J.*, 1923, lxxxi, No. 11, p. 883.
6. SHERMAN, H. C., AND GETTLER, A. O., *J. Biol. Chem.*, 1912, xi, p. 325.
7. MCLEAN, *Report of the Medical Research Council*, 1924-25.
8. BLACKFAN, K. D., *Bull. Johns Hopkins Hosp.*, 1926, xxxix, 69.

OBSERVATIONS ON THE USE OF SYNTHALIN IN THE TREATMENT OF DIABETES MELLITUS*

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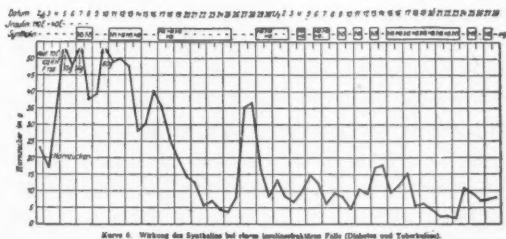
Montreal

THE general interest in the report from Minkowski's Clinic in Breslau of a compound with insulin-like action for the treatment of diabetes mellitus and which can be administered by mouth, has prompted this brief report of the experience we have had with it to date.† From a review of the little literature on this subject it appears that this is probably representative of the consensus of experience of the few clinics which have employed it.

In 1926 Frank, Nothmann and Wagner,¹ reported that butylamin-guanidine had a definite influence on the metabolism of carbohydrates. When given to a normal dog it produced hypo-glycæmia. This reaction was accompanied by severe gastro-intestinal disturbances ("Krämpfe") which were relieved by the administration of glucose. When given to totally depancreatized dogs similar results were obtained. That it assisted in the metabolism of carbohydrates in the diabetic (depancreatized) dog was further suggested from simultaneous studies of the sugar contents of arterial and venous bloods. Before its administration the sugar contents of the bloods from the femoral artery and vein were practically identical, namely, 0.300 and 0.296 per cent respectively. Two and three-quarter hours after its administration the sugar contents of the bloods from both sources had decreased and that of the arterial blood was higher than that of the

venous specimen. The blood sugar from femoral artery was 0.241 per cent, and that of the femoral vein was 0.219 per cent. This indicated that less sugar left the limb than had entered it. The sugar was therefore either oxidized or stored.

This compound was also found to be effective in human diabetes. A series of cases were reported, the most striking of which was that of a patient with diabetes complicated by tuberculosis and who reacted poorly to insulin. The results obtained in this case are graphically recorded in the accompanying chart, which is a reproduction from the original article.



Kurve 6. Wirkung des Synthalin bei einem insulinresistenten Falle (Diabetes und Tuberkulose).

Action of synthalin in a case of diabetes and tuberculosis which was refractory to insulin.

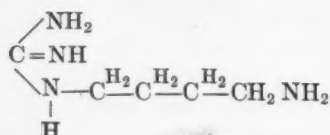
From the original observations, Frank, Nothmann and Wagner concluded that this guanidine compound reduces the sugar content of the blood and the excretion of sugar in the urine, one milligram assisting in the metabolism of about 1 gramme of sugar. Other symptoms of diabetes, such as polyuria and polydipsia, are made to disappear. In some instances, such as infection, gangrene, etc., when the individual is refractory to insulin, butylamin-guanidine is efficacious. In a series of subsequent reports²

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† In this report are also recorded the experiences of Dr. E. P. Joslin. The writer is indebted to Dr. Joslin for a detailed report of his still unpublished findings and permission to incorporate them with our own.

of further experiences the original observations were confirmed. It is stated that this compound acts more slowly than insulin but its effects last longer.

The chemical structure of this compound is known. It is as follows:—



For purposes of simplicity it has been named *Synthalin*.

Since then very few other reports have appeared in the literature and amongst these is that of Hetényi³ who found that in ten cases out of a series of fourteen the results were similar to those of Frank, Nothmann and Wagner. In the four remaining cases synthalin could not be employed because of the disagreeable effects (loss of appetite, nausea, vomiting, etc.). Occasionally albuminuria was found. Hetényi concluded that because of these by-effects the use of this substance was not practical, in spite of the fact that it rendered the urine sugar free and its effects were lasting.

Merklen and Wolf⁴ employed it in two cases of very severe diabetes and found it could neither replace insulin nor act as an adjuvant to it. They also noted the occurrence of gastro-intestinal disturbances.

Joslin⁵ states that "synthalin acts in diabetes". In one case it was possible to reduce the insulin from 28 units daily to 16 units daily though the carbohydrate, protein and fat in the diet were maintained at their previous levels. In another case 13 units of insulin were totally replaced with synthalin, and the patient's blood sugar for an interval of two weeks fell nearly to the normal level. The urine of a third patient became sugar-free with diet and insulin, the insulin was then omitted and he too remained sugar-free with synthalin, but, as Joslin points out, he was a recently treated case and might have done so anyway. One patient with hyperthyroidism did better after operation with synthalin, replacing insulin, than one would have expected without insulin. Because of his past experience with seventy-five other diabetics with hyperthyroidism Joslin stresses the significance of this result. One patient

disliked synthalin and two others with a few grammes of sugar in the urine appeared to be more nearly sugar-free or more consistently sugar-free when synthalin was used. Synthalin did not act efficaciously in one true diabetic who happened to have a low blood sugar threshold.

Nausea and vomiting occurred in the first case, but by spreading the dose this was subsequently avoided. Synthalin appeared to work better after successive turns of two doses at a time with a day's interval following the medication. Joslin's opinion is that the substance is worthy of continued use and that with a better knowledge of it there would be a group of diabetics in which it could be employed advantageously.

In our experience there have been both successes and failures. The fact, however, that it has proven successful encourages further experiment with it. The following case illustrates one strikingly good result. For brevity the blood and urinary sugar and body weight data only are given in detail in the accompanying table.

The patient was a male, aged 48, with severe diabetes. On February 19, 1927, on a diet consisting of 50 gm. of carbohydrates, 150 gm. of fat and 50 gm. of protein, and no insulin, the urine contained 28 gm. of sugar, and also acetone bodies. The excretion of total organic acids per day amounted to 2,600 c.c. N/10. The blood sugar in the fasting state was 0.267 per cent. On this day he weighed 139 pounds. On 25 units of insulin a day (that is, 15-0-10), it was possible render the urine free from sugar and acetone bodies, and on February 23rd, there was a slight degree of hyperglycemia (0.131 per cent). The body weight had increased five pounds. The evening dose of insulin was discontinued on the following day; the result was a decrease of body weight, hyperglycemia and glycosuria. The evening dose of 10 units was again given on the 27th; the urine became sugar-free, and the body-weight increased. This appeared to show that this patient did require the evening dose of insulin. On March 2nd the evening dose of insulin was discontinued, and 50 milligrams of synthalin were given that day, (that is, 25-0-25). With this procedure the urine remained sugar-free and the blood became normal. It will be noted that the body weight did not increase as with insulin. Four days after the institution of synthalin treatment, he complained of nausea and abdominal pain. He vomited once. There was a suggestive subicteroid tint to the conjunctivæ. At this time the indirect van den Bergh reaction was positive and there was an excess excretion of urobilinogen in the urine, namely, a 1/64 dilution by the Wallace and Diamond method. The following day synthalin was discontinued but the insulin dosage was not increased. The result was a return of glycosuria and hyperglycemia. On March 9th there were no gastro-intestinal symptoms and synthalin was again given. The result was that the urine became sugar-free and the blood sugar gradually returned to the normal level. On March 17th there were again gastro-intestinal upsets, and synthalin was discontinued without, however, increasing the insulin. The result was glycosuria and hyperglycemia. On March

22nd synthalin treatment was again instituted, and the urine became sugar-free and the blood sugar practically normal. On the 26th the patient developed cramps, and the synthalin was discontinued on the following day. At this time insulin was given in the evening, and the urine remained sugar-free and the blood sugar became normal. On the 31st the evening dose of insulin was discontinued and this was replaced by 25 mgm. of synthalin. The urine remained sugar-free and the blood sugar practically normal until April 25th. It will be noted that on April 14th there was a definite hyperglycemia. At this time, however, he had a "cold".

I have not seen this patient since, but in a letter dated May 15th, I find that he had no sugar in his urine, his body weight was 142 pounds, and there was no history of any further gastro-intestinal upsets. It will therefore be noted that in this case it was first made certain that the evening dose of insulin was essential, but that this dose of 10 units could be replaced by 25 mgm. of synthalin. It is interesting here to note that in Joslin's case 3 mgm. of synthalin replaced one unit of insulin. It should also be noted that the body weights are, on the average, less with synthalin than they are with insulin.

TABLE I

	Urine Sugar	Blood Sugar	Body Weight	Remarks
Date	Gram- mes	Per Cent	Lbs.	
Feb. 19	28.4	0.267	139	Insulin 15-0-10
20	3.2		140	
21	0		143	
22	0		142½	
23	0	0.131	144	Insulin 15-0-0
24	6.2	0.226	145	
25	10.7		141	
26	16.4	0.231	140½	
27	1.7		142	Insulin 15-0-10
28	0		142½	
Mar. 1	0	0.146	144	Insulin 15-0-0 Synthalin 25-0--25
2	0		142	
3	0		141	Abdominal pain, nau- sea. No synthalin.
4	0	0.132	141½	
5	0	0.109	142	No discomfort. In- sulin 15-0-0 Synthalin 0-0--25
6	4.6		139	
7	6.2	0.216	140	
8	11.4	0.222	139½	
9	2.1		140	
10	0		141	
11	0	0.164	141½	
12	0		140	
13	0	0.132	141½	
14	0	0.134	141	
15	0		139½	Cramps very bad. In- sulin 15-0-0. No synthalin.
16	0	0.125	140	
17	6.2		139	
18	8.4	0.183	141	No discomfort.
19	5.7		141	
20	11.2	0.168	141½	

TABLE I (Continued)

	Urine Sugar	Blood Sugar	Body Weight	Remarks
Date	Gram- mes	Per Cent	Lbs.	
21	8.1		139¾	Insulin 15-0-0. Synthalin 0-0--25
22	2.1		142	
23	3.2		141	Cramps, nausea. In- sulin 15-0-0. No synthalin.
24	0	0.146	141½	
25	0		140	
26	0	0.133	141	
27	0		141½	
28	0		142	No discomfort. Insulin 15-0-0. Synthalin 0-0--25
29	0		142¾	
30	0	0.127	144	
31	0		145½	
Apr. 1	0		143½	"Cold" (headache, coryza, etc.).
2	0		142	
3	0	0.132	142½	
4	0		?	
5	0	0.146	141	
6	0		141½	
7	0	0.120	142	
8	0		140	
9	0	0.135	141	
10	0		142	
11	0		141½	
12	0		140	
13	0		139½	
14	0	0.162	138	
15	0		139	
16	0		140½	
17	0	0.130	140	
18	0		141	
19	0		142	
20	0	0.143	140½	
21	0		141	
22	0		141½	
23	0	0.117	140	
24	0		140¾	
25	0	0.120	141½	

Six other patients were carefully selected from the point of view of reliability and severity of disease. All of these patients required about 10 units (8-12) of insulin once a day to keep the urine free of sugar and blood sugars normal. One of these (H.D.L.) has been sugar-free since February with the exception of traces of sugar in the urine on six occasions during March. Another (C. McG.) has also kept sugar-free with the exception of traces of sugar in the urine five times during April. In one case (H. K. O.) the synthalin failed. In case M. C. the urine was sugar-free for one month only, after that sugar returned, and it appears to be impossible to clear it up again with synthalin alone. The urine of one patient (L. L. C.) has been entirely sugar-free since February. One case (F. B.) was sugar-free for two months, and since then

it has been impossible to keep him sugar-free with synthalin alone.

As with the case the details of which are given, it has been found in all of these six that the average body weights are less with synthalin than with insulin, as the following table shows.

AVERAGE BODY WEIGHT FOR TWO MONTHS (POUNDS)

Subject	With Insulin	With Synthalin
H. D. L.....	158	150
C. McG.....	162	154
H. K. O.....	145	142
M. C.....	170	167
L. L. C.....	138	138
F. B.....	144	141

The question may well be asked whether the extra weight in the case of insulin is to be attributed to insulin edema.

Another case (J. H. B.) is of interest, though it is not stressed because of the short period of time the patient has been taking synthalin. This patient has been under observation in the clinic for some time and required 20 units of insulin to keep the urine sugar-free. His blood sugars, in the fasting state, have never been normal, ranging between 0.14 and 0.16 per cent. On June 2, 1927, the blood sugar was 0.156 per cent and before giving him synthalin it was considered advisable to test the necessity of the amount of insulin he was taking. He was advised to reduce the dose of insulin to 15 units a day. On June 9th, one week later, the blood sugar was 0.200 per cent. Now instead of again increasing the insulin to 20 units it was further decreased to 10 units and 25 mgm. of synthalin was given. On June 17th, the blood sugar was 0.175 per cent. On June 24th, one week later, it was 0.161 per cent. On this day all the insulin was discontinued. He was now taking synthalin only. On July 2nd, the urine was sugar-free and the blood sugar was normal (0.126 per cent). He returned again for observation on July 9th; the urine was then sugar-free and the blood was 0.139 per cent.

In one case (No. 357-27) synthalin was substituted for insulin four days after the patient recovered from coma. It failed to act. Glycosuria and acetoneuria rapidly reappeared. Another patient (No. 119-27) refractory to insulin was also refractory to synthalin.

In three instances where 50 mgm. doses were given daily, intestinal upsets appeared on the fourth day, and in one of these cases a positive indirect van den Bergh reaction was found in

the blood and an excess of urobilinogen in the urine. In another they appeared on the sixth day, and in this case there was also a positive indirect van den Bergh reaction. In two cases there have been no disturbances with 25 mgm. doses given every second day. It has been found that gastro-intestinal upsets are more readily prevented when the material is given for two days, followed by two days rest and then repeated. The number of observations, however, is small and one would not suggest that this is the ideal procedure for all cases. It might be here stated that the positive van den Bergh reactions were not marked. Expressing it quantitatively there were between two and three units of bilirubin. These observations suggest that these gastro-intestinal disturbances are associated either with hæmolysis or liver damage. Since, however, the observations have been so few in number limited significance must be attached to them. Frank tends to the view that one may become accustomed to the gastro-intestinal disturbances and suggests an analogy in nicotine. (*Der Symptomen-komplex der ersten Zigarre hindert schliesslich die wenigsten daran, tüchtige Raucher zu werden.*)

Summing up, it may reasonably be stated that synthalin is effective in diabetes. On account, however, of numerous vagaries, gastro-intestinal disturbances, dosage, time of administration, etc., it appears that its use at the present time should be confined to hospitals in which the metabolism of patients can be carefully observed. Though there are failures, the successes certainly warrant its more general trial in hospitals with properly equipped laboratories.

I am indebted to Professor Frank of Breslau for the early supply of this material for investigation.

The writer wishes to gratefully acknowledge the technical assistance of Miss Helen Chisholm in this work.

REFERENCES

1. FRANK, E., NOTHMANN, M., AND WAGNER, A., *Klin. Woch.*, 5, Nr. 45, 1926.
2. *Deutsch. Med. Woch.*, lii, No. 27, p. 2067; 1926, lii, No. 27, 2067 and 2107. *Klin. Woch.*, 1926, 5, Nr. 45. *Verhand. d. Ges. f. Verd. u. Stoff.*, 1927. *Therap. d. Gegen.*, No. 1, 1927.
3. HETÉNYI, G., From foreign letters, *J. Am. M. Ass.*, 1927, lxxxviii, 1093.
4. MERKLEN, P., AND WOLF, M., *Bull. et Mem. Med. Soc., Hop. de Paris*, 1927, 1, 1834.
5. JOSLIN, E. P., Paper read at meeting (1927) of Soc. Clin. Invest., Personal communication.

AN EPIDEMIC OF ROSEOLA INFANTUM

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THE disease known as roseola infantum has only been generally recognized within the last few years. Although scattered references to it occur in the literature, it was first accurately described by Zahorsky in 1910, and again in 1913. His account seems to have attracted little attention, and it was not until 1921, when a fresh series of cases was reported by Veeder and Hempelmann under the name of exanthem subitum that the disease won general recognition. Immediately after this, cases were recorded from various points in America, from Europe and Asia, but even yet the disease is not included in many of the most modern text-books.

Nevertheless, once its characteristics have been pointed out, it is one of the most clear-cut and definite of the eruptive diseases. Its occurrence in young infants, and the striking course of development of the symptoms are unmistakable. There is the abrupt onset, three or four days of high fever with little constitutional disturbance, followed by a crisis, and then the appearance of a rash. The eruption only lasts two days, but is almost always profuse, and very similar in all cases. It strongly resembles German measles, and in fact has usually been diagnosed as such in the past, but the history of the prodromal fever immediately distinguishes it. It must be of very frequent occurrence for all writers report 20, 30 or 40 cases all seen within two or three years; in fact it is probably the commonest exanthem occurring in infants under two years, with the possible exception of measles and varicella.

There are only two points to which I wish to call attention in the present communication. The first is the age of the patients affected. The vast majority of the reported cases have been between the ages of 4 and 18 months. In fact of several hundred cases recorded only four or five have been over 2 years and it is possible that in these there was a mistake in the diagnosis.

The second point concerns the nature of the

disease and whether it is contagious. A considerable difference of opinion on this point seems to have arisen. In his original description Zahorsky says: "The disease is not contagious, only in one family did more than one case occur. The comparative isolation of these young children renders the assumption of a contagion almost impossible." Veeder and Hempelmann in their classical description state: "So far as we have been able to observe, the disease seemingly does not belong to the ordinary group of exanthems in childhood transmitted by direct contact."

On the other hand Porter and Carter in the last edition of their text-book say: "The disease is mildly contagious". The last edition of Holt and Howland's text-book states: "Nothing is known regarding the infective agent, the lesions produced or the method of propagating. It appears to be very slightly contagious, for not more than one child in a household is attacked at the same time." Griffith and Mitchell in the edition of their work just issued say: "Its nature is not certainly determined. Infectiousness must be slight, since in none of the published cases has there been more than one case in a family." David Levy in a report of a number of cases says: "The cases which number approximately 30 have in some instances occurred sporadically; in other instances four or five cases have grouped themselves in a manner suggestive of mild epidemics. In no instance, however, could one case be traced to another as evidencing communicability." Heiman in his admirable review of the literature of the disease in 1925 says: "No case has ever been seen by us or anyone else which could be related to another known case. It is this surprising freedom from contagion that is one of the most conspicuous features of the disease, and one which makes the incubation period a mystery, and makes it exceedingly difficult to clinically arrive at the solution of the etiology." Brown and Tisdall in their recent *Common Procedures*

in *Pædiatrics* say flatly: "The disease is not contagious."

It is this confusion and uncertainty which has led me to report the following series of cases which were observed last year in the wards of the Montreal Foundling and Sick Baby Hospital. I may here state that the Montreal Foundling Hospital accommodates about 70 infants all under three years of age, and is divided into separate wards of about 10 patients each of approximately the same age.

The first case Orman H., was an infant of four and one-half months, admitted to the hospital January 24, 1926, and placed directly in a ward containing nine other infants all between the ages of 4 and 12 months, no precautions to prevent possible infection being taken. On January 29th, five days after admission, he suffered a sudden inexplicable rise of temperature to 103°. The temperature remained elevated for three days and on February 1st a crisis occurred followed by the appearance of the characteristic rash covering the entire body and lasting for two days.

Albert B., 10 months of age, who was in the same ward all this time became ill February 8th, just ten days after the first case. He also had three days' fever with a fall of temperature on February 11th, followed immediately by a similar eruption. About ten days later a group of three cases occurred together. Hugh B., 10 months of age, had a rise of temperature on

February 15th. Ernest W., 5 months, on February 17th, and Gerald F., 10 months, on February 18th. Each of these had the characteristic three or four days' fever followed by a crisis and the same eruption. The last case, Harry C., 12 months of age, was taken sick on March 5th, with a crisis and eruption on March 7th.

All these cases were unmistakable, typical and similar. They were seen by all the staff of the hospital who concurred in the diagnosis. They were all in the same ward; thus out of 10 children in the ward six developed the disease with an apparent incubation period of approximately 10 days. The disease did not spread to any other ward in the institution, although as I have said there were 70 infants in the house and no serious precautions were taken to prevent it.

It would appear from this occurrence that we may state definitely that roseola infantum is a mildly infectious disease, with an incubation period of about ten days. It confines itself in its typical manifestations to infants between the ages of four months and two years. One rarely sees more than one case in a family because it is rare to have more than one child of the susceptible age in the household. It is probably conveyed by carriers of other ages who do not react in the same way to the infection.

Treatment of Neurosyphilis by Malaria—

Paul A. O'Leary, Rochester, Minn., reports the status of the original 100 patients treated by this method, and also calls attention to other features noted in the observation of 113 patients treated subsequently. In a series of 100 patients with various manifestations of neurosyphilis who were inoculated with *Plasmodium vivax* between June, 1924, and February, 1926, there were fifty-seven cases of general paralysis, of which twenty-eight (49 per cent) are still in remission as measured by the economic status of the patients. Of the thirteen patients presenting the syndrome of paresis sine paresi or asymptomatic general paralysis, six have been materially improved, and the factors in the blood and spinal fluid have been reversed to normal in four. The evidence still supports the assertion that in the serologically negative cases of tabes with persistent lightning pains or gastric crises, malaria inoculation is beneficial if the general condition of the patient will permit him to tolerate it. Like-

wise, in the group with optic atrophy benefit has accrued; in four of the nine cases in which this treatment was carried out, the loss of vision has been apparently arrested. The method of treatment is not without risk, as evidenced by a mortality of 5 per cent, only those cases in which the malaria was a factor being considered. For parenchymatous neurosyphilis in debilitated and senile patients, tryparsamide is still to be preferred. The clinical results have been more pronounced when the fever treatment was instituted early in the course of the general paralysis before much degeneration had taken place, but striking results have been noted in cases in which the clinical signs of general paralysis were present four years before the inoculation. Experience with the fever treatment of Wagner von Jauregg during the last three years in 278 cases has definitely proved that it is the most valuable method of treatment suggested for parietic parenchymatous neurosyphilis.—*Jour. Am. Med. Ass.*, July 9, 1927.

SEROLOGY IN ARTHRITIS*

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THE etiology of arthritis deformans has been a difficult problem at all times and to-day, although positive bacteriological evidence is still lacking, the infection theory seems to be the most acceptable. This condition, described also as rheumatoid arthritis, chronic articular rheumatism, chronic rheumatic arthritis, chronic villous polyarthritis, nodose rheumatism, rheumatic gout, Still's disease, chronic infectious arthritis, atrophic arthritis, etc., seems to be associated with definite septic foci, especially in the tonsils, teeth, intestines and prostate. Also the majority of acute infections, furunculosis, boils and, according to Stockman,¹⁴ dermatitis and lupus erythematosus, may be regarded as primary causes of this condition. "In view of the great prevalence and refractory nature of arthritis, it deserves to be classed as one of the major chapters of clinical medicine. A more general familiarity with the subtleties of the disease and with the measures necessary for successful therapy would achieve a great reduction of suffering and economic loss on the part of society." (Pemberton and Pierce¹⁰).

From the extensive literature on the subject, it appears that various organisms are responsible for this condition, the most prevalent among which are the staphylococci, streptococci and the gonococcus. Although it is evident from the clinical manifestations of the disease, that an infectious agent is the responsible one, yet bacteriology has failed, so far, to isolate the factor directly responsible for it. Those few investigators who claim to have succeeded in isolating such organisms from the body fluids have failed to reproduce a similar condition.

The failure to obtain a responsible agent by the usual bacteriological methods, led investigators to resort to immunology, preparing vaccines and sera from the organisms suspected to be the cause of such a condition and thus giving rise to a "specific" therapy; the organisms

mostly employed were streptococci and staphylococci. But the encouraging results obtained with this therapy were also found with the use of other protein substances not allied with the suspected agents (protein-shock reaction). "It can be said at once that the results obtained warrant the statement that, in the non-specific protein reaction, there has been placed in the hands of the physician a weapon which he may justifiably use in the treatment of rheumatoid arthritis, with considerable probability of success."¹³

The important contributions of serology in the last few years in lues, gonorrhœa, tuberculosis, echinococcosis, etc., led investigators to apply the well-known method of complement fixation, with the aim of detecting specific antibodies in the sera of arthritic patients. The greatest stress was laid on different strains of streptococci which appeared to be the most common invaders of the seat of infection. The first problem was to see whether specific immune bodies were called forth by the various strains of streptococci.

In 1911 Swift and Thro¹⁵ first tried to solve this problem and concluded: "Immune bodies, specific for different strains of streptococci, can be demonstrated by means of the complement fixation test. It is possible that by the use of this test we have a means of studying specific streptococcus infections." The authors worked with the *Diplococcus rheumaticus*; a streptococcus isolated from a rheumatic joint; another isolated from the blood of a scarlet fever patient; one isolated from a tonsil; and one isolated from the blood of a case of malignant endocarditis. Their work, of capital importance, showed, as stated above, that there are immune bodies specific for different strains of streptococci.

In 1912 Major,⁸ having obtained cultures of *S. viridans* from a case of endocarditis lenta and having prepared an antigen from it, found that the serum of the patient who had supplied

*From the Laboratory of the Shriners' Hospital for Crippled Children, Montreal Unit, aided by a grant from Mr. H. J. Elliott, K.C.

the organism fixed the complement, while no fixation took place with the serum of six other patients suffering from other diseases. It was of interest to the author to find, however, that the serum of the same patient gave a fixation also with an antigen prepared from the *S. pyogenes*, although no fixation was obtained with another antigen prepared from the pneumococcus.

In 1913 Hastings,⁶ following the same technique employed by Schwartz and McNeil¹² in gonorrhœa, employed the complement fixation test in arthritis deformans, using antigens prepared from streptococcus, gonococcus and other organisms. The author, in 24 cases of arthritis deformans of from two to fifteen years' duration, found that six reacted to strains of *S. viridans*. Four cases of typical arthritis deformans reacted to the gonococcus, one of them to the *S. viridans* also. Three cases which were classed, from their history, as infective arthritis deformans reacted to gonococcus. The deformities were typical of arthritis deformans. In twelve cases of typical arthritis deformans, the tests were negative for the Wassermann reaction, for the gonococcus, for the streptococcus and for the staphylococcus. Hastings obtained also a negative complement fixation test in three cases of infective endocarditis in which the *S. viridans* had been isolated from the blood. In another case of *S. pyogenes* septicæmia, in which the streptococcus was isolated from the blood, the complement fixation was also negative. In one case of chronic infective adenitis simulating Hodgkins' disease, and in one case of simple purpura, the complement fixation test was positive for three strains of *S. viridans*.

Richards,¹¹ in 1920, made a cultural and immunological study of the *S. viridans* in chronic arthritis with the result that of 104 cases, 68 gave a positive complement fixation for *S. viridans*, although only 14 gave positive culture for the same micro-organism.

Burbank and Hadjopoulos,² in 1925, having adopted a modified complement fixation test in more than a thousand cases of arthritis and having employed antigens prepared mostly from the *S. hæmolyticus* and the *S. viridans*, claim to have succeeded in classifying the infective arthritides into three clinical and serological entities: first, acute or subacute periartthritis caused solely by the *S. hæmolyticus*; second,

exudative periartthritis (arthritis deformans), caused also by a *S. hæmolyticus* but of a different strain; third, chronic productive osteoarthritis (hypertrophic arthritis), caused exclusively by the *S. viridans*.

According to the results of the above-mentioned investigators, various strains of streptococci are very likely responsible for most conditions of chronic arthritis.

Investigators in this field have prepared the antigens by using suspensions of killed organisms, although some, as for example, Swift and Thro, dried the washed organisms and ground them, without heating. The German school has found antigens prepared from heated bacteria the most satisfactory. Major, working with the *S. viridans* grown in glucose broth, washed the cultures with NaCl solution and heated the suspension at 60° C. for half an hour.

Hastings used the same method as Major, following the procedure of Schwartz and McNeil for the preparation of the gonococcus antigen, i.e., heating the suspension of bacteria for half an hour at 60° C. Richards used a salt ground bacterial emulsion, thoroughly washed and un-killed. Burbank and Hadjopoulos prepared their antigen with a suspension of living micro-organisms in NaCl solution to which 1 per cent of phenol was added.

The twenty-two antigens used by Hastings included the *S. viridans*, *S. hæmolyticus*, *M. rheumaticus*, pneumococcus, *M. aureus*, *M. albus* and *M. tetragenus*. The *S. viridans* strains included six from tooth sockets of patients with pyorrhœa alveolaris, two from tonsils, one from sputum, three from blood and one from the prostate. Richards, and Burbank and Hadjopoulos obtained most of their strains of *S. viridans* and *S. hæmolyticus* directly from blood cultures.

Previous investigators, in performing the test, have followed the general technique of the complement fixation for gonorrhœa as used by Schwartz and McNeil, with the usual preliminary titration of the hæmolytic system and inactivation of the patient's serum. Burbank and Hadjopoulos claim that by using polyvalent antigens and a method previously employed by Hadjopoulos⁵ in syphilis, they have developed a method of greater sensitivity and specificity for the study of infective arthritis. Their method consists mainly of working with active

serum and making use of the natural complement contained in the fresh serum of the patient. In this way, according to them, the deleterious effect of heat on antibodies is avoided and a reaction of greater sensitivity is obtained.

I followed the technique advised by Burbank and Hadjopoulos in the preparation and titration of the antigens and in the general procedure of the test. The problem set before me was, first, to determine whether cases of arthritis deformans responded to antigens of some suspected streptococci; second, to make a comparative study of the two methods: (1) using active serum as proposed by Burbank and Hadjopoulos, and (2) using inactive serum according to the method generally employed.

I prepared twenty-six polyvalent antigens including strains of the *S. viridans*, *S. hæmolyticus*, *S. pyogenes erysipelatis*, *S. hæmolyticus endocarditis* (Loewe), *S. scarlatinae* (Dick), *S. ulcerative colitis* (Rosenow), *S. morbilli*, *S. pyogenes* isolated from cases of puerperal sepsis, *S. choreæ* (Rosenow), *S. chronic arthritis* (Rosenow), *S. polyomyelitis* (Rosenow), *S. encephalitis* (Evans), *S. equi*, streptococci isolated from ulcer of the stomach (Rosenow), *S. pyogenes* from sore throat, *B. coli communis* and *B. coli communior*. A portion of the above micro-organisms were isolated from infected tonsils and from blood cultures and another portion was supplied by the American Type Culture Collection in Chicago.

The *B. coli communis* and *B. coli communior* were grown on agar slants. The remaining micro-organisms were transplanted on blood agar and colonies from this medium were transplanted in 25 c.c. of 1 per cent neutral glucose broth. After four days incubation at 37° C. the sediment was washed with sterile NaCl solution several times and a fixed amount of the resulting sediment after the last centrifugalization, was suspended in 10 c.c. of 1 per cent phenol NaCl solution. The same procedure was observed for the *B. coli communis* and the *B. coli communior*. The antigen used for the gonococcus contained the various different strains isolated by Torrey.

Referring to the preparation of the antigen, Burbank and Hadjopoulos say: "The final sediment was suspended in 10 c.c. of 1 per cent phenol saline solution and 0.5 c.c. of a 1:50 dilution of this constituted our arbitrary antigenic unit to be titrated for its hæmolytic anti-

complementary and specific values." In the preparation of my polyvalent antigens, I found that not all the strains of streptococci give the same amount of growth when transplanted in broth. Some give a very luxuriant growth and consequently a rich sediment. Others, on the contrary, show such a poor growth that barely a small floccule is seen at the bottom of the culture tube. Consequently when the various strains of streptococci are washed and then mixed, to prepare the polyvalent antigen, some strains are represented in a portion five or ten times larger than others. To prevent this, I transplanted the primary growth into ten or more 25 c.c. broth culture tubes, instead of five. After the last washing of the final sediment of each individual strain with NaCl solution, I took care that all strains concurring with the preparation of the polyvalent antigen were represented in the same fixed amount, measuring this in a graduated conical centrifuge tube kept at the same centrifugal speed and with the same time of centrifugalization for all. Although such modification would not give an exact number of organisms for each c.c. of antigen, yet, roughly speaking, it would give a relatively constant amount of bacterial suspension. Hastings, to this effect, worked with antigens containing 1,000 million cocci for each cubic centimeter. In addition to the titration method of the authors, I followed that generally employed for the titration of antigens, i.e., using a positive serum of arthritis deformans, in which lues and gonorrhœa were clinically and serologically excluded, a normal serum and NaCl solution.

For the Burbank-Hadjopoulos method, I used sera not more than 24-48 hours old, the anti-complementary value, as a rule, being between 0.01 c.c. and 0.025 c.c. The standard dose of the antigen used was one-half of the anti-complementary titer. The 0.5 per cent sensitized sheep cell suspension was prepared by using 99.5 c.c. of NaCl solution of 0.9 per cent and 0.5 c.c. of sheep's blood washed three times for 10 minutes at a uniform speed, to which blood suspension, 0.1 c.c. of a 1 per cent anti-sheep amboceptor was added. For the other method, I used the ordinary complement fixation reaction as used for gonorrhœa, following the technique given by Kolmer,⁷ and, furthermore, removing the natural anti-sheep amboceptor from the patient's serum as advocated by Simon.¹³

In this preliminary work, using three polyvalent antigens, i.e., a *S. viridans*, a *S. hæmolyticus* and a gonococcus antigen, I obtained the following results:—

Of 33 cases of arthritis deformans:—

- 10 were positive for *S. viridans* alone.
- 5 were positive for *S. viridans* and gonococcus.
- 4 were positive for *S. viridans*, gonococcus and *S. hæmolyticus*.

hæmolyticus.

- 1 was positive for *S. viridans* and lues.
- 13 responded negatively to all antigens.

Of 48 cases of various diseases with no history of arthritis and in which lues was serologically excluded:—

- 6 were positive for *S. viridans* alone.
- 8 were positive for *S. viridans* and gonococcus.
- 4 were positive for *S. viridans* and *hæmolyticus*.
- 9 were positive for gonococcus alone.
- 11 responded negatively to all antigens.

Of 120 apparently normal cases:—

- 7 were positive for *S. viridans* alone.
- 17 were positive for *S. viridans* and gonococcus.
- 9 were positive for the gonococcus alone.
- 87 responded negatively to all antigens.

Of 69 cases of gonorrhœa in various stages:—

- 12 were positive for *S. viridans* alone.
- 14 were positive for *S. viridans* and gonococcus.
- 28 were positive for the gonococcus alone.
- 15 responded negatively to all antigens.

Of 42 cases of lues:—

- 7 were positive for *S. viridans* alone.
- 12 were positive for *S. viridans* and gonococcus.
- 5 were positive for the gonococcus alone.
- 18 responded negatively to all antigens.

Of eighteen cases of clinically diagnosed bone tuberculosis, mostly in children, with the exception of two which were positive for the *S. viridans*, all responded negatively to the various antigens.

From the above results, it is evident that the large majority of cases of arthritis and other diseases examined responded to the *S. viridans* and to the gonococcus antigens. This may, no doubt, be put in relation to the fact that most of the sera tested were obtained from outpatient departments and especially the genitourinary of the Montreal General Hospital and that the apparently normal cases could not be thoroughly examined as to foci of infection. However, Burbank and Hadjopoulos also say: "In controlling the value of the test in normal cases, the possibility of the presence of some masked focus of infection must be considered. With this point in mind, the test is not diagnostic for arthritis alone, but is diagnostic of a wide group of acute and chronic infections that give rise to anti-streptococcic bodies in human serums."

Investigators seem to agree regarding the gonococcus being the etiological factor in a good many cases of arthritis and among those who have confirmed this serologically is Hastings who, as previously stated, obtained out of twenty-four cases of arthritis deformans, seven positive complement fixations with the gonococcus. "It is true that in a good proportion of the cases, arthritis will develop shortly after the initial infection. In general, however, it is not until fibrous changes in and about the prostate, ampulla of the vas and ejaculatory ducts are well developed that symptoms appear. These fibrous changes constrict and so encase the vesicles and ducts that normal drainage is either limited or interfered with entirely. The subsequent changes in the vesicles then participate in the etiology of numerous conditions, prominent among which is the involvement of the joints." (Morrissey⁹).

In active tuberculosis, arthritis seems to be infrequent. Lawrason Brown, mentioned by Pemberton and Pierce, found only eleven positive cases of rheumatoid involvement among 4499 cases of tuberculosis.

In my opinion, and judging from the results obtained with only three antigens, the *S. viridans*, the gonococcus and, in a minor degree, also the *S. hæmolyticus*, play an important part in arthritis. No doubt other micro-organisms may also be responsible for another large percentage of cases of arthritis, as I have already noted in a few cases with other antigens and especially that of the *S. pyogenes*. According to Billington and Crabbe,¹ "a very high percentage of rheumatic affections may, for practical purposes, be regarded as metastatic manifestations of focal bacterial infection."

But for the present, admitting the infection theory, it seems as if the etiology of arthritis must be put in relation to more than one organism and until a definite solution of the problem is found, we must agree with Ewald⁴ in saying: "Any longstanding or passive disturbance of the normal joint mechanism must (not may) sooner or later lead to arthritis deformans."

CONCLUSIONS

1. With the limited number of sera examined and the three antigens used, the predominant invaders in arthritis deformans seem to be the

S. viridans and the gonococcus either associated with each other or by themselves.

2. There is no marked discrepancy between the results obtained by following the Burbank-Hadjopoulos method and that of the complement fixation usually employed, together with the removal of the natural anti-sheep amboceptor.

REFERENCES

1. BILLINGTON, S. G. AND CRABBE, S., *Brit. M. J.*, 1924, i, 1087-1089.
2. BURBANK, R., AND HADJOPOULOS, L. G., *J. Am. M. Ass.*, 1925, lxxxiv, 637-641.
3. CAMPBELL, D., *Glasgow M. J.*, 1925, ciii, 79-89.
4. EWALD, P., *Munch. med. Wochenschr.*, 1925, lxxii, 384-386.
5. HADJOPOULOS, L. G., *J. M. Res.*, 1922, xliii, 455-472.
6. HASTINGS, T. W., *J. Am. M. Ass.*, 1911, lx, 24.
7. KOLMER, J. A., *Infection, immunity and specific therapy*, Phil. and Lond., 1915, 483.
8. MAJOR, R. H., *Johns Hopkins Hosp. Bull.*, 1912, xxiii, 326-332.
9. MORRISSEY, J. H., *Med. J. & Record*, Jan. 19, 1927, cxxv, 108-112.
11. PEMBERTON, R., AND PIERCE, E. G., *Am. J. M. Sc.*, 1927, clxxiii, 31-46.
11. RICHARDS, J. H., *J. Bact.*, 1920, v, 511-525.
12. SCHWARTZ, H. J., AND McNEIL, A., *Am. J. M. Sc.*, 1911, cxli, 693-709.
13. SIMON, C. E., *J. Am. M. Ass.*, 1919, lxxii, 1535.
14. STOCKMAN, R., *Glasgow, M. J.*, 1925, ciii, 73-78.
15. SWIFT, H. F., AND THRO, W. C., *Arch. Int. Med.*, 1911, vii, 24.

A CASE OF CHRONIC DERMATOMYOSITIS

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ALTHOUGH this patient was only under my observation for a few days immediately before his death, and little opportunity was given for study along modern lines, the case seems worthy of reporting, not only on account of the rarity of this peculiar clinical condition, generally called dermatomyositis, but also because this particular case is very interesting from an endocrinic viewpoint. The history pieced together from several sources is as follows:—

Male, aged 24 years, Nova Scotian, never abroad, single, farmer and quarryman; came under my observation, April 14, 1927, complaining of a skin rash and of pains and soreness in the shoulders, with general muscular stiffness of marked degree interfering with locomotion, and causing difficulty in swallowing and in speaking.

Family History was that of a strong, vigorous family.

Personal History.—Always strong and robust and never ill. In fact, his three brothers, unusually big able men, state he was the strongest of them all.

Present Illness.—Early in the winter of 1925-1926 his friends noticed that he seemed to be losing his energy; that at times he appeared dull and drowsy, and would lie down during the day

to rest—a previously unheard-of thing for him to do. About the same time, or a little later, he complained that his strength was not so good and he mentioned that his "grip" was weaker. Nothing more definite occurred until one stormy day during the winter, on his return home from his day's work, his mother noticed his face was red and swollen, particularly the forehead and about the eyes. This was looked upon as a "weather burn" at first, but it did not clear up and persisted to the end. Although his face was red and swollen, it was never tender or painful. Soon after the onset of this, a pain in the small of the back and over the hips troubled him, and shortly afterwards his hands and feet began to swell; and before long a moderate œdema or swelling became generalized, and persisted until a few weeks before he came under observation. He also suffered greatly from the cold. Soon after the onset of the œdema, his voice became thick and husky, and this was shortly followed by a gradual stiffening of all his muscles. There was no joint pain, no joint stiffness, no joint swelling, no paralysis, no actual inco-ordination, but a slowly progressing, inexorable increase in the stiffening of his voluntary muscles, until finally he could not get about, and later could not even turn over in bed. A few months

before admission the difficulty of speech became much worse and dysphagia became prominent. The dysarthria, the dysphagia and the general muscular stiffness increased until his death, although the œdema or swelling entirely disappeared.

There was some difference of opinion among the relatives as to his mental condition; some thought he had become mentally much duller, others were not so sure of it. The redness was first noticed on his face, where it persisted. Later, it appeared on several other parts of his body; and in some of them it remained permanently. The rash was not accompanied by itching, burning or any discomfort.

During his illness of nearly a year and a half, apart from a rather poor appetite, moderate constipation, and for a short period nocturia, the only other symptoms were pains about the shoulders, hips and back at times.

He was in the Victoria General Hospital for a short stay in August, 1926, and the notes made of this examination at that time were as follows:—A fairly well set up male; well nourished; face broadened; hands and feet thickened but the flesh did not pit on pressure; mentality poor; affirmative answers were given to all suggested questions; a diffuse flush was present on the face extending over the nose, cheeks, chin, forehead and eyelids. The hair was very thin and dry; the skin harsh and dry, and the teeth poor; all the systems were examined and found normal.

On August 17th a Wassermann test was taken and found to be negative; basal metabolic rate taken on the same day was plus 32; a second taken on the 20th showed plus 26; taken again at Camp Hill Hospital on the 22nd, it was plus 22. X-ray of skull showed an area of rarefaction on the vertex at the coronal suture; the sella turcica was apparently of the "closed type".

Examination of the blood on August 20th revealed as follows:—red cells, 5,500,000; white cells, 8,200; polynuclears, 72 per cent; large lymphocytes, 10 per cent; small lymphocytes, 15 per cent; eosinophiles, 2 per cent; transitionals, 1 per cent; hæmoglobin, 80 per cent. The red cells were normal in size, shape and staining.

When I saw him in April, 1927, that is, eight months after this examination, his condition had

undergone a most extensive alteration. No mention had previously been made of any muscular stiffness, dysphagia or dysarthria, conditions which now overshadowed all else in the symptomatology. He was very poorly nourished; all the muscles of the body were hard, board-hard in fact, especially those of the thighs and back. The hardness was uniform in any one muscle, but varied considerably in different muscles, and there was no localized area to suggest any ossification. No tenderness was complained of on palpation, voluntary movement was slow, laborious and minimal; he could not even turn over in bed, and lay in the position he was placed with his lower and upper extremities semiflexed. The extremities could not be extended either actively or passively owing to the fact that his muscles were rigid and inelastic. There was no evidence of joint trouble and no evidence of any nervous phenomena. His shoulders were elevated and fixed, his scapulæ prominent, and his neck stiff. His face was set and immobile, except for the active normal movements of the eyes, which seemed to me to belie the apparent slow cerebration. Swallowing was almost impossible, even for liquids. The effort to swallow looked very much like that in a severe case of quinsy, but was not painful. It is interesting to note that on one occasion he vomited, freely and easily. His mouth was very slightly opened and his lower jaw practically immovable. When asked a question, it was an appreciable time before he answered, and then in a most peculiar explosive manner, three or four words only at a time, in a high-pitched, weird, mechanical voice. His skin was dry and harsh; his hair sparse; his teeth bad; and there was a mottled erythematous rash on the face; on the wrists were patches two to five cm. in diameter; on the back was a faint diffuse blush. There was no eruption on arms, legs or abdomen. The tonsils, as far as could be seen, were small and septic. The examination of heart and lungs revealed no evidences of any pathological condition. The abdomen was so rigid that palpation was hopeless. No sign of the enlarged spleen mentioned in some of the literature was demonstrable. Urinalyses were negative. I am sorry to say no blood chemistry was done. The blood Wassermann was negative. The basal metabolic rate was plus 31. The

temperature, pulse and respiration were normal. X-ray showed no ossification of the muscles.

Examination of the blood showed hæmoglobin, 65 per cent; red cells, 4,000,000; white cells, 7,500; polynuclears, 70 per cent; large mononuclears, 13.5 per cent; small mononuclears, 9.5 per cent; eosinophiles, 7 per cent; the red cells were normal in size and shape.

He was taken home by relatives and died suddenly two days later, whether from choking, or from broncho-pneumonia or other cause, I do not know, though his mother said he vomited up a basinful of what appeared very much like blood from the stomach—a thick brownish red fluid.

The literature to which I have access gives but meagre accounts of this clinical entity, the descriptions being hazy and incomplete. Apparently the case must be regarded as one of dermatomyositis, a generalized myositis with dermal changes and œdema. The long duration, the almost complete absence of pain, the course, and residence only in Nova Scotia rules out trichiniasis, even though a biopsy was not done. Neuromyositis must be excluded as there was no ataxia or other evidence of disease of the nervous system. The picture was not that of syphilitic myositis, and two Wassermann tests were negative. The absence of any localized bony hardness and the negative x-ray examinations rule out myositis ossificans progressiva. The conditions described under the title myositis fibrosa is neither in its clinical findings or its course, like this case; and suppurative myositis is excluded by the absence of fever and suppuration, and by the course and termination. It is unfortunate that a detailed biochemical ex-

amination could not be carried out. Even the kidney function tests, in the presence of œdema and normal urine, would have been interesting.

I can find no discussion of dermatomyositis from an endocrine viewpoint, and yet what particularly attracted my attention in this case was the apparent disagreement between the basal metabolic rate and the clinical findings. Especially in the early stages, before the muscular stiffness became prominent, the clinical picture must have resembled in many respects that of myxœdema: mental dullness, drowsiness, dry skin, harsh, thin hair, thickening of hands and feet, broadening of face, a generalized non-pitting œdema, and increased sensitiveness to cold, and this diagnosis was actually held until the metabolic rate was reported as showing high plus readings. These were checked several times at two institutions by several observers, and when shortly before his death, he was under my care, it was again found to be high. Nevertheless in the presence of a high basal metabolic rate, there was no excessive perspiration, no diarrhoea, no tachycardia, no eye signs, no thyroid enlargement, no tremors, nothing in short to support the heightened metabolic rate, in a patient lying still in bed in every sense of the word, running no temperature and with normal pulse and respirations. The question naturally arises, was his metabolism actually increased, and was it due to his thyroid? Is a heightened metabolic rate, excluding other known causes, always indicative of hyperthyroidism? And finally, is dermatomyositis due to an infection or is it an endocrinopathy?

Free Post-Graduate Education.—The Medical Society of the State of New York is offering graduate education, without cost, to every physician in the State. In the belief that responsibility for graduate education rests on organized medicine, which should assume leadership in the solution of public health problems, the Medical Society of the State of New York decided to carry education to those who were unable to leave their homes. During the past two years clinical lectures and demonstrations have been given in fifty-one of the sixty-two counties of the State by fifty or sixty teachers from the larger cities. In return for this service the teachers receive "the thanks of the committee, travelling expenses, and a small honorarium." The whole of the costs are met by the medical society and the

State Department of Health, which has borne most of the cost of the lectures on obstetrics and pædiatrics. The lectures are given on the same day for six or more successive weeks in the spring and autumn, and occupy one to two hours. No attempt is made to train specialists; the object is to raise the standard of practice in the community. The medical society believes that the majority of disease conditions yield to clinical diagnosis, which is still the most important factor in the practice of medicine. Consequently comprehensive laboratory courses are not included in the schedule. Alliance with medical schools and county medical societies is sought, and the plan is considered possible wherever there are hospitals and men willing and able to teach.

POLYPUS OF THE SMALL INTESTINE

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THE chief interest in polypus of the small intestine seems to centre around it as a cause of intussusception. Short of intussusception there is quite enough of importance in the condition to attract our attention. It may be present for a long time, and probably is as a rule, before the climax of intussusception is reached, causing troublesome symptoms and periodic attacks of severe pain, for which the patient earnestly seeks relief without satisfaction.

The following case presents some features that appear worthy of being recorded.

CASE REPORT

Mr. A. A. D., age 47, farmer, was admitted to the Victoria General Hospital, March 10, 1927, complaining of severe abdominal pain, vomiting and faintness. He was of the athletic type, vigorous, and hard-working. For years he was troubled with what he termed "indigestion", in the form of much belching of gas, and abdominal discomfort. Two years ago he had a sharp attack of pain in his upper abdomen followed by jaundice. This attack lasted but a few days, and with the exception of the "indigestion" referred to, he felt fairly well until the onset of the present attack. Excepting the above there was nothing relevant in his personal history.

The present trouble began one week or ten days before admission to the hospital, with sudden, severe pain across the upper half of the abdomen. The pain was agonizing and shock producing, and was followed by jaundice of moderate degree. These attacks occurred about every second night prior to his admission to hospital, and his physician reported that not less than $\frac{3}{4}$ grain of morphia, within the hour, would relieve the pain to a bearable degree. The bowels had not been acting satisfactorily for the past few weeks. He had a tendency to constipation.

On admission to the hospital he was ap-

parently normal, the pain having been relieved by morphia on the way. The abdomen was flat, but its muscles were resistant to pressure. The temperature and pulse were normal. Blood pressure systolic 125; diastolic 75.

Systematic examination revealed no evidence of organic disease anywhere. Rectal and abdominal examination revealed absolutely nothing to give us a clue.

He remained comfortable and normal in appearance until the following day when suddenly he was seized with extremely severe abdominal pain which caused him to become pale or "ashen" and weak. The pain which was continuous and punctuated by spasms of great severity, was across the abdomen in the region of the umbilicus.

The abdomen seemed contracted, both recti were very rigid, (the left more than the right) and the only point of tenderness elicited was to the left of the midline and above the umbilicus. An enema gave good results. It was, however, necessary to administer three hypodermic doses of morphia, of $\frac{1}{4}$ gr. each, within the hour to relieve the pain.

For the following three days he was perfectly comfortable and free from symptoms, but during these days the bowels had not moved, though laxatives were given freely. In the meantime an x-ray examination of the gall bladder was made with normal findings.

On the third day since his last painful attack, he had a sudden severe seizure of pain, which was definitely spasmodic, and now for the first time a mass could be palpated, and was also readily visible, at the outer border of the left rectus, slightly below the umbilicus. It was now admitted by the patient for the first time that he had had fairly sharp but short attacks of pain in the abdomen, of a spasmodic character, every day or two for several months.

A barium enema was administered, and an x-ray of the colon made. The report was that there was a narrowing, or apparent obstruction

at the splenic flexure. No barium was administered by mouth for obvious reasons. This was not, in location, in accord with the definite clinical findings, and was not regarded seriously. It was, however, evident that the abdomen should be opened, and conditions dealt with according to the findings after opening. The provisional diagnosis was obstruction due to an intrinsic tumour of the bowel.

At operation, which was performed at once, nothing abnormal was found in the large bowel. The ileum and jejunum were collapsed to a point about eight or ten inches from the beginning of the latter, where a mass the size of an orange was found. For a distance of two and one-half feet distal to the mass, the collapsed bowel had a width of two and one-half inches, flattened and even as if ironed out, but with rounded borders, and resembling a collapsed old inner tube of a small automobile tire. Its wall was abnormally thick (oedema?), heavy, stiffened, and suggesting inertness. The colon was rather pale, and the peritoneal coat lacking in lustre, with here and there a suspicion of exudate, or at least roughening of the surfaces. Several waxy, yellowish white streaks, one-sixteenth inch in diameter, wavy and raised, traversed the surface somewhat obliquely from the mesenteric border to the free border. These were not parallel to each other, except in a somewhat general way, and in no instance were they in the course of the vessels and lymphatics of the bowel wall.

This remarkable enlarged portion of the intestine terminated at its distal end abruptly, in a collapsed jejunum of normal appearance, making an outstanding contrast, while at the upper end it received within its wide inactive mouth, normal though distended jejunum containing what afterwards was found to be a polypus. Above this intussusception was distended bowel, *viz.*, the upper eight or ten inches of the jejunum.

The mesentery corresponding to the peculiar two and one-half feet described, was packed with enlarged, tense vessels, particularly the veins—and was abnormally thick, heavy and dusky. No enlarged glands were noted. The mass was an intussusception three and one-half inches in its long axis, easily reduced, and on palpation of released portion the intrinsic tumour (a polypus) was found.

The bowel was opened and the tumour removed. The polypus was composed of a body from which fringe-like digitations sprang, and a pedicle about two inches long. The whole mass was rather soft and in *volume* one and one-half ounces. At a point one inch distal to the base of the pedicle there was infolding of the bowel wall for one quarter of the bowel circumference, and this was obviously an old affair, as if a partial intussusception had occurred, and becoming inflamed, remained fixed by firm (old) peritoneal adhesions.

The recent unfolding of the bowel began at a point distal to the pedicle attachment of the tumour, and at the point where the abnormal enlargement of ileum, already described, began. The intestinal mucosa at the site of bowel incision was dusky and congested, and thrown into large prominent folds, even proximal to the attachment of the pedicle, as far as could be seen, and suggested the probability of an inflammatory process in the mucosa spreading into and along the duodenum, and if this be so, would explain the mild jaundice. The direct examination of the gall bladder and ducts revealed nothing abnormal.

The two and one-half feet of jejunum distal to the intussusception, so greatly increased in diameter (two and one-half inches), limp, heavy, and inert, apparently a passive tube incapable of function, gave one much concern. However, within 12 hours the bowels moved naturally, and continued to do so in a normal manner. There was no post-operative nausea nor vomiting, and no abdominal distension or pain, and conditions since leaving the hospital are in every respect satisfactory.

He has no "belching" of gas, nor feeling of "indigestion," as formerly.

COMMENTS

This condition it would appear was the cause of the so-called "indigestion" which had troubled him for years, and the paroxysmal attacks of pain in more recent times, passing under various diagnoses over a long period. One would like to be able to state with positiveness a causative relation to his attacks of mild jaundice. There is at least an apparent relationship.

The history and the clinical features of the attacks are impressively in harmony with the

conditions found at operation, and suggest more attention to this condition as a possibility, than reference works give in discussing the diagnosis of abdominal conditions causing severe paroxysmal pain.

The sudden appearance of the tumour, in this case, where repeated and careful search for such previously had revealed none, appears to be the completing, or apex stone of a diagnostic pyramid.

The recurring attacks of pain were likely due to a temporary intussusception, spontaneously or with the aid of the morphine and atrophine becoming released.

This case demonstrates the superlative value of careful history taking, systematic clinical observation, and the employment of *reliable clinical methods*, as a sure and reliable foundation for diagnosis.

The pathological conditions noted in relation to the two and one-half feet of jejunum and

mesentery distal to the obstruction I cannot explain, and seek your help, but the conditions relating to the intussusception fully support the observations of Wardill¹ as to the mechanism of production of intussusception, that this is not due to the dragging of the bowel wall into the bowel lumen by the attached pedicle. In this case the recent infolding of the bowel was at a point definitely and considerably distal to the attachment of the pedicle to the bowel wall.

If we give a place in our minds to this condition as a possibility, when thinking in terms of the possible causes of so-called "indigestion" and paroxysmal abdominal pain, it is reasonable to think that many of these cases will be recognized and relieved, before a crisis is reached in the form of an established intussusception with obstruction.

REFERENCE

1. WARDILL, W. E. M., *Brit. J. Surg.*, 1925, xiii, 158.

STUDIES ON THE BLOOD IN PERNICIOUS ANÆMIA*

BY BEAUMONT S. CORNELL

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I.—THE WASSERMANN REACTION

THE statement is occasionally met with in the literature that the blood serum of pernicious anæmia frequently gives a positive Wassermann reaction in the absence of syphilis. In sixty-four cases of true Addisonian anæmia without history or clinical manifestation of syphilis, the writer specially examined this point. These cases were all from the rural parts of Ontario where syphilis is uncommon. The patients were in every stage of the disease from the most perfect remissions to coma. The reactions were done within twenty-four hours from the time of taking the specimens. Mr. Rudolph Steiner, Wassermann technician at the Johns Hopkins Hospital accompanied the writer on this tour and did the tests. He employed the same antigen and technique as used

at that hospital. The technique is a slight modification of the original Wassermann. When he had finished he sent the remainder of the specimens each day to Dr. C. M. Anderson, Director of the Public Health Laboratories, Toronto, who co-operated by doing Kolmer Wassermann reactions as a check.

The results, by both methods, were all consistently negative. One patient gave a one plus positive with the Hopkins antigen and a two plus positive with this antigen when carried out in the ice-box. Next day the Kolmer Wassermann reaction was negative. There was nothing unusual about this case, except her age. She was seventy-one years old and was in a beginning relapse, with glossitis and much sensory disturbance of the extremities. There was no history nor any suggestion of syphilis in the case.

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This series does not support the statement that the blood in pernicious anæmia frequently gives a positive Wassermann reaction in the absence of syphilis.

II.—DETERMINATION OF LIPASE AND CHOLESTERINASE

Simon¹ observed in the serum of pernicious anæmia a lipase which differed from normal serum lipase in being resistant to the effect of atoxyl. This atoxyl-resistant lipase he found also in several other conditions, chiefly in conditions in which the pancreas was obviously involved or definitely diseased. He believes that the presence of such a lipase is an indication of pancreatic disease. Neither Simon nor the present author are interested in any possible hypothesis connecting the pancreas etiologi-

cally with pernicious anæmia. Our interest is merely in the observation itself.

Lipase titrations were carried out, employing Simon's technique, on the sera of thirty-five cases of pernicious anæmia.

Technique.—The method consists in allowing the serum to act upon a substratum composed of a trybutyrin emulsion, and measuring the change in surface tension after a definite time. The substratum is prepared by vigorous shaking of a mixture of 0.5 c.c. tributyrin to 100 c.c. of a buffer solution of pH8, followed by filtration. The buffer solution is prepared by mixing 5 c.c. M/15 primary potassium phosphate with 95 c.c. M/15 secondary sodium phosphate. The emulsion so prepared will keep in the ice-chest for several days. It is best to shake again each time before using. The original shaking should be from five to ten

TABLE I
PRESENCE OF LIPASE ACTIVITY INDICATED BY FALL IN NUMBER OF DROPS DELIVERED

Laboratory Number	Condition of Patient	Age of Serum	Number of Drops Delivered							
			Serum and Substrate				Serum, Substrate and Atoxyl			
			(after)				(after)			
			0	20 min.	60 min.	120 min.	0	20 min.	60 min.	120 min.
4	remission	72 hrs.	51	50	50	53	50	50	50	52
5	remission	48 hrs.	52	53	50	55	54	56	52	54
6	relapse	48 hrs.	54	54	50	54	54	50	50	54
8	remission	48 hrs.	53	53	54	51	53	51	52	52
9	remission	48 hrs.	53	55	52	54	53	50	54	52
11	remission	48 hrs.	52	52	51	53	51	50	49	42
13	relapse	48 hrs.	52	53	51	56	52	52	52	55
14	remission	48 hrs.	51	51	53	49	51	56	54	52
17	relapse	96 hrs.	53	53	56	57	52	52	54	56
18	remission	96 hrs.	54	52	53	57	52	51	56	56
19	relapse	96 hrs.	54	52	55	55	55	52	56	57
20	relapse	48 hrs.	55	54	54	51	54	56	51	52
21	relapse	48 hrs.	53	56	54	52	55	54	54	52
22	remission	48 hrs.	54	56	53	52	54	54	54	53
23	remission	96 hrs.	52	58	58	59	56	57	56	58
25	remission	96 hrs.	57	57	56	57	55	56	56	56
26	relapse	96 hrs.	54	52	53	55	52	55	56	55
27	remission	96 hrs.	54	56	56	55	54	55	55	53
28	remission	96 hrs.	53	55	56	52	56	55	57	54
29	remission	96 hrs.	56	53	53	52	56	55	55	53
30	remission	96 hrs.	55	56	56	51	55	54	57	51
31	relapse	96 hrs.	54	57	54	50	54	56	55	52
32	remission	48 hrs.	51	54	54	54	54	54	54	57
33	relapse	48 hrs.	55	56	54	53	55	54	56	55
33	relapse	48 hrs.	55	56	54	53	55	54	56	55
34	remission	48 hrs.	55	55	55	55	55	54	56	55
36	relapse	72 hrs.	56	57	58	57	56	55	56	58
38	remission	48 hrs.	53	57	57	56	53	56	53	54
39	remission	48 hrs.	57	55	54	57	56	51	54	55
41	relapse	48 hrs.	56	56	58	56	56	55	57	57
42	remission	48 hrs.	57	57	59	58	54	56	55	58
43	remission	48 hrs.	56	57	57	57	56	56	58	59
44	relapse	48 hrs.	56	56	56	59	55	55	55	59
50	remission	72 hrs.	56	56	56	56	54	56	57	57
52	remission	48 hrs.	56	55	57	57	55	57	57	57
53	relapse	72 hrs.	58	58	60	56	59	59	61	57

minutes. Two solutions are now prepared as follows:

- (a) 1 c.c. serum and 50 c.c. substrate.
- (b) 1 c.c. serum, 50 c.c. substrate, and 1.0 mg. atoxyl.

The practical difficulty of weighing out 1.0 mg. atoxyl may be overcome by preparing a portion of the buffer solution with atoxyl in the concentration of 2 mg. to 100 c.c.

These solutions are covered with 5 c.c. toluol and allowed to stand in the incubator. Readings of the surface tension are taken at 0, 20, 60 and 120 minutes. The surface tension changes are indicated by changes in the number of drops of the solution that are delivered for a unit volume from the same dropping pipette (after Rona and Michaelis). Thus, as fat is hydrolyzed by the enzyme the surface tension increases, i.e., the number of drops per unit volume decreases. Hence the delivery of fewer drops than the initial reading indicates the presence of active lipase.

The results are shown Table I.

It is quite evident that serum lipase loses its power as the serum ages. In four cases only (Nos. 20, 29, 30, 31) was there any evidence of the presence of active lipase, and this was evidently atoxyl-resistant. These results are practically negative for the presence of tributyrinase, and it is felt that although the unavoidable delay occurring between the time of taking the samples and doing the test partly explains the results, no considerable concentration of the enzyme could have been present.

In fifteen cases estimations were made regarding the amount of *cholesterinase* present in these sera.

The method consists in allowing the serum to act upon a substrate composed of an emulsion of cholesterol benzoate and measuring the amount of cholesterol produced after a definite time. The substrate was prepared by dissolving 1 gramme of cholesterol in a little hot methyl alcohol, pouring with constant stirring into 100 c.c. of a 1 per cent solution of sodium fluoride in water, and heating on the water bath for a short time to drive off the methyl alcohol. Two solutions are then prepared as follows:—

- (a) 1 c.c. serum and 5 c.c. substrate.
- (b) 1 c.c. serum (boiled) and 5 c.c. substrate.

The boiling inactivates *cholesterinase*. The two solutions are placed in the incubator at 37.5° C. for two hours, each covered with toluol. At the end of two hours each sample is separately examined for its cholesterol content. For the cholesterol estimation a slight modification by Perlzweig of Sacket's method was used. The results are shown in Table II.

In half the cases there was a slight indication of *cholesterinase* activity, but not to any significant extent.

CONCLUSION

After forty-eight hours serum of pernicious anemia gives no evidence of any significant tributyrinase or *cholesterinase* activity.

REFERENCE

1. SIMON, H., *Klinische Wchnschr.*, 1925, iv, 2295.

TABLE II

PRESENCE OF CHOLESTERINASE ACTIVITY INDICATED BY INCREASE IN FIRST COLUMN FIGURES

Laboratory Number	Condition of Patient	Age of Serum	Number of mg. Cholesterol per c.c. after 2 hours	
			Serum and Substrate	Serum (boiled) and Substrate
5	remission	48 hrs.	0.149	0.142
13	relapse	48 hrs.	0.124	0.097
14	remission	48 hrs.	0.210	0.272
20	relapse	48 hrs.	0.070	0.077
23	remission	96 hrs.	0.152	0.125
26	relapse	96 hrs.	0.112	0.128
27	remission	96 hrs.	0.197	0.213
28	remission	96 hrs.	0.418	0.376
29	remission	96 hrs.	0.398	0.344
31	relapse	96 hrs.	0.255	0.215
32	remission	48 hrs.	0.088	0.085
33	relapse	48 hrs.	0.085	0.087
41	relapse	48 hrs.	0.091	0.095
50	remission	72 hrs.	0.280	0.290
53	relapse	72 hrs.	0.122	0.114

SOME DIFFERENCES IN THE BEHAVIOUR OF RAW, PASTEURIZED, BOILED, EVAPORATED AND DRIED MILK AT THE HYDROGEN-ION CONCENTRATION OF THE STOMACH*

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COW'S milk which has been subjected to heat or drying is now an accepted food for infants and young children. This is the case not only when the circumstances demand special precautions against bacterial contamination, but also under certain conditions of difficult digestion and assimilation. The new knowledge of vitamins and the ease with which a possible vitamin deficiency can be made up, has helped to give confidence in the use of boiled, evaporated or dried milk when its employment seems to be indicated.

The explanation most commonly offered for the greater digestibility of these forms of milk is that with them the casein forms a more flocculent precipitate in the stomach than with raw or pasteurized milk. It is claimed by the proprietors of some of the dried milks on the market that x-ray examination of stomach contents shows this to be true.

Aside from the considerable work done upon vitamin content, there are two groups of investigations reported in the literature on the changes in cow's milk brought about by heat and drying. One set is concerned with determining directly the changes in the content of soluble calcium, phosphorus and protein, and the changes in the character of the casein coagulability. The other set consists of feeding experiments with animals to discover the effect upon retention, particularly that of calcium and phosphorus. Though the results are not entirely in agreement, the general conclusion is that the content of soluble calcium, phosphorus and protein is reduced, to a greater or less degree, in milk which has been subjected to heat, and that retention of calcium and phosphorus, when such milk is the food, is less than with raw milk.

Reference should be made in passing to the

claim made for most of the evaporated and dried milks that their fat is in a more finely divided state and is more easily digested than that of fresh milk. So far as this is true, it is to be accounted for by homogenization during the process of preparation and by the formation in the stomach of a flocculent casein curd—which enables the fat-splitting enzyme to come in contact with the fat. Examination under low power of the microscope shows considerable difference among the various dried milks in size and uniformity of fat globules.

This study is an attempt to compare evaporated, dried, heated and unheated milk under conditions approximating those found in infants' stomachs. The work of Marriott¹ on the stomach acidity of infants under different conditions was taken as a starting point. His findings briefly are as follows: the hydrogen-ion concentration of the stomach contents of breast-fed infants whose digestion is normal averages P_H 3.75; of breast-fed infants whose digestion is not normal P_H 4.74; of normal infants fed cow's milk when unaccustomed to it, P_H 5.3, after becoming accustomed, P_H 4.75; and that of infants taking cow's milk whose digestion is not normal P_H 5.35. These results were obtained by Marriott by the use of his colorimetric method and were confirmed by Davidsohn's electrometric measurements².

In our work evaporated and dried milks were reconstructed with distilled water according to the composition reported by the proprietors. Boiled milk was made to the original volume with distilled water after boiling three minutes. The quantities of 5N HCl found necessary to bring fresh milk to the respective hydrogen-ion concentrations of P_H 3.75, 4.75 and 5.35 were added from a graduated pipette. In the first part of the work larger quantities of more dilute acid were used and rennin and pepsin were included in the preparations. The samples were kept for about half an hour at approximately 40° C. by

* From the Laboratories of the Sub-Department of Paediatrics of the University of Toronto and the Hospital for Sick Children, Toronto. Read before the Fifth Annual Meeting of the Canadian Society for the Study of Diseases of Children, Toronto, June 14, 1927.

placing the containers in warm water. The hydrogen-ion concentration of the unacidified milk and of the samples as acidified was determined by Marriott's method, which consists of dialyzing a small sample in a collodion sac for a definite length of time and reading the colour developed in the dialyzate with a suitable indicator against a standard solution with the same indicator. In this work the colour chart of W. M. Clark was used as standard. The fact that the hydrogen-ion concentrations aimed at, P_H 3.75, 4.75, and 5.35, all fall within the range of a single indicator, and that one whose colours are easily read from the chart, helped to ensure the accuracy of the hydrogen-ion determinations. The unacidified milk was tested for acidity and showed, for fresh milk, almost invariably a hydrogen-ion concentration of P_H 6.6, for the dried milks, commonly P_H 6.5, and for the evaporated milks, P_H 6.4.

I. BUFFER CAPACITY OF THE VARIOUS FORMS OF MILK

The same quantity of acid added to the various forms of milk being studied produced on an average practically the same hydrogen-ion concentration in all, with one exception. There was considerable range in all cases, probably because a fairly concentrated acid was used in small quantities. A check determination was made, in which all the forms of milk were modified on one occasion, in order to eliminate as far as possible variations in technique. The results of this were, on the whole, in close agreement with the corresponding averages as can be seen in Table I. One brand of evaporated milk apparently has a slightly greater buffer capacity than any of the other forms of milk examined. As this difference shows in all three degrees of

acidity, it seems fair to assume that it is of some significance. A possible explanation is that this brand of evaporated milk may have a somewhat greater concentration than is claimed for it.

2. CALCIUM AND PROTEIN CONTENT OF THE WHEY OF PASTEURIZED FRESH AND EVAPORATED MILK

At the beginning of the work it was attempted to separate the curd from the whey completely and to determine the total calcium and protein content of the whey. At first the procedure of L. L. Van Slyke³ was followed, the separation being made by means of a Berkfeld filter. This method was found to be unsatisfactory under the conditions of the work, as a more thorough cleansing of the candles than was practicable was required between filterings. For this reason the separation was carried out by filtering through paper and washing the precipitate with distilled water. The results from this part of the work are shown in Table II. It is seen that there is no significant difference between pasteurized fresh and evaporated milk in the soluble calcium content at the higher and at the medium acidity and but little at the lower acidity. L. L. Van Slyke⁴ found in milk soured by bacteria all the calcium in the whey. Judging from the organisms used by him for souring the milk, the hydrogen-ion concentration developed must have been about P_H 4.8 to 5.0, corresponding to the medium acidity shown here. Van Slyke also claims that the lactalbumin is completely soluble in the acid milk. Our preparations contained rennin and pepsin and consequently the nitrogen content computed as protein is greater than can be accounted for by the lactalbumin. There is close agreement between the pasteurized and the evaporated milks in nitrogen content at each of the

TABLE I
COMPARISON OF BUFFER CAPACITY

	I	II	III
Raw	3.60—4.30 (ave.) 3.80 (spec.) 3.70	4.70—5.10 (ave.) 4.95 (spec.) 4.86	5.35—5.90 (ave.) 5.60 (spec.) 5.45
Past.	3.60—3.85 (ave.) 3.75 (spec.) 3.65	4.55—5.35 (ave.) 4.95 (spec.) 4.85	5.50—5.85 (ave.) 5.70 (spec.) 5.50
Boiled	3.55—3.90 (ave.) 3.75 (spec.) 3.70	4.55—5.40 (ave.) 4.90 (spec.) 4.90	5.40—5.90 (ave.) 5.70 (spec.) 5.40
Evap. I	3.70—4.40 (ave.) 4.05 (spec.) 3.75	4.70—5.25 (ave.) 4.95 (spec.) 4.70	5.15—5.70 (ave.) 5.45 (spec.) 5.20
Evap. II	3.50—4.50 (ave.) 4.10 (spec.) 3.90	4.80—5.30 (ave.) 5.15 (spec.) 5.00	5.35—5.70 (ave.) 5.55 (spec.) 5.65
Dried (S)	3.50—3.80 (ave.) 3.65 (spec.) 3.65	4.40—5.00 (ave.) 4.65 (spec.) 4.60	5.05—5.55 (ave.) 5.35 (spec.) 5.25
Dried (R)	3.40—4.20 (ave.) 3.70 (spec.) 3.50	4.60—5.05 (ave.) 4.75 (spec.) 4.20	5.35—5.35 (ave.) 5.35 (spec.) 5.30

TABLE II
CAO, AND PROTEIN OF WHEY IN GRAMMES
PER 100 C.C. OF MILK

	PH 3.85		PH 4.70		PH 5.35	
	CaO	Prot.	CaO	Prot.	CaO	Prot.
Past. Fresh.	0.152	1.82	0.158	1.09	0.132	1.24
Evap. I.	0.165	1.81	0.167	1.02	0.109	1.12

acidities. The varying nitrogen content of the whey at the different acidities is probably the result of the combined effect of enzyme activity and acid coagulation of casein at the given acidity. The character of the casein coagulation showed marked differences at the three degrees of acidity. At P_H 4.7 it was such that a clear filtrate was readily obtained, while at P_H 3.85 the filtrate was always cloudy. At P_H 5.35 conditions for filtration were between those at the other two acidities and the filtrate was not entirely clear. In view of the introduction of this filtration factor, it is questionable whether these findings are quantitatively of importance as applied to infant feeding. They are undoubtedly significant as indicating the different conditions obtained at the varying hydrogen-ion concentrations.

3. CONCENTRATION OF CALCIUM AND PROTEIN IN THE WHEY

In the rest of the work the necessity for filtration was avoided by separating the curd from the whey by centrifuging the samples and pouring off the supernatant fluid. Consequently the whey could not be measured quantitatively and the values are those of concentration in the whey. The acidifying and heating of the milk samples was comparable with that in the first part of the work. Fifty cubic centimeter centrifuge tubes were used and the length of time and speed of centrifuging was uniform with all the samples. The whey used for analysis was poured off through filter paper to prevent the inclusion of traces of curd. Calcium and protein were determined in the whey, and the proportion and character of the curd thrown down were noted. The results are given in Tables III, IV and V. In Table

TABLE III
CAO PER CENT OF WHEY

	PH 3.75	PH 4.80	PH 5.45
Raw	0.190	0.179	0.177
Past.	0.182	0.163	0.162
Boiled	0.185	0.175
Evap. I	0.201	0.153	0.147
Evap. II	0.250	0.162
Dried (S)	0.184	0.178	0.174
Dried (R)	0.169	0.153	0.133

TABLE IV
PROTEIN PER CENT OF WHEY

	PH 3.75		PH 4.80		PH 5.45	
	1	2	1	2	1	2
Raw.	0.696	0.729	0.757	0.922	0.776	0.945
Past.	0.637	0.845	0.706	0.828	0.688	0.810
Boiled	0.276	0.390	0.286	0.440	0.334	0.477
Evap. I.	0.441	0.462	0.420	0.545	0.452	0.552
Evap. II.	0.304	0.491	0.352	0.532	0.370	0.530
Dried (S)	0.651	0.915	0.624	0.922	0.647	0.948
Dried (R)	0.546	0.404	0.416

TABLE V
CURD PER CENT OF MILK (CENTRIFUGAL)

	PH 3.75	PH 4.80	PH 5.45
Raw	31	22	23
Past.	33	24	24
Boiled	30	23	21
Evap. I	47	44	41
Evap. II	53	49	49
Dried (S)	33	28	25
Dried (R)	22	17	14

IV the second column in each acidity group gives the values for the estimations made in a composite sample from two separations in each of the series with rennin included in the preparations. In the first column the values are averages of a considerable number of determinations. No rennin was used in these samples and these protein values only are considered in the discussion.

A study of the three tables together brings out some marked differences among the various milks, which on the whole are consistent through the different acidities. There are slight inconsistencies in the lower acidities seen in the calcium values for the evaporated milks and in the protein values for dried milk by roller process. The relationship for the curd holds through all the acidities. If for simplicity the findings at P_H 3.75 alone are considered, this relationship is as follows: the smallest and most compact curd and the lowest calcium concentration of the whey are found in dried milk by roller process; the largest and most fluid curd and the highest calcium concentration of the whey in the evaporated milks, both brands; while all the other forms studied lie about midway between these extremes, both in respect to character and proportion of curd and in calcium concentration of the whey. All these forms, raw, pasteurized and boiled milk and milk dried by spray process, show no significant differences among themselves. As regards protein concentration in the whey, these various milks take a different order of arrangement. The lowest protein concentration is found in the whey of boiled fresh milk; the highest in raw and pasteurized fresh milk and milk dried by spray process; while between the

extremes are found milk dried by roller process and the evaporated milks.

The differences in calcium concentration of whey among the different forms of milk and at the different acidities are probably not sufficiently great to be of practical importance, but their relation to the character and proportion of curd thrown down is interesting and suggestive. The differences in protein concentration of the whey are relatively greater and may be of significance under some circumstances. This soluble protein must be for the most part what is left of the five or six tenths per cent lactalbumin of the original milk. It is seen in Table IV that the percentage of the original lactalbumin found in the whey of the different forms of milk varies widely and appears in general to correspond to the amount of heat to which the milk was subjected in the preparation. Thus, boiled milk whey shows less than fifty per cent of the original content and raw fresh milk the entire amount.

In contrast with the small absolute differences found in the soluble calcium and protein content of these milks, the differences in the character of the casein coagulation are striking, as shown in Table V. It is interesting to note that though boiling the milk had the greatest effect on the lactalbumin content of the whey, the curd of the boiled milk showed no essential difference from that of raw and pasteurized milk and milk dried by spray process. Thus, heat is not the only factor concerned in effecting changes in the character of the casein coagulation. In all the

forms of milk studied, except the evaporated milks, the compactness and cheesiness of the curd was increased as the acidity was decreased up to the limit observed. This is not entirely in agreement with the findings reported earlier in the paper on preparations in which digestive enzymes were included.

The fat formed a clean-cut film on the top of the whey in the evaporated and boiled milks. In the raw and pasteurized fresh milks there was usually a more or less irregular layer of fat including crumbles of curd. The dried milks were between these two groups in respect to the cleanness with which the fat separated out.

CONCLUSION

The striking difference among the different forms of milk studied as brought out by this work is in the character of the casein curd thrown down by acid. Evaporated milks give a bulky and fluid curd; milk dried by roller process a rather compact and cheesy curd; and fresh milk, raw, pasteurized and boiled and milk dried by spray process a curd with characteristics between those of the other two groups. The absolute differences in soluble calcium and protein content are not great but may be of significance in some conditions of difficult feeding.

REFERENCES

1. MARRIOTT, W. McK., and DAVIDSON, L. T., *Am. J. Dis. Children*, 1923, xxvi, 542.
2. DAVIDSON, H., *Arch. f. Kinderh.*, April, 1921, lxi, 239.
3. VAN SLYKE, L. L., and BOSWORTH, A. W., *Technical Bull.*, 39, New York Agri. Exper. Station, Dec., 1914.
4. VAN SLYKE, L. L., and BOSWORTH, A. W., *J. Biol. Chem.*, March, 1916, xxiv, 191.

Insulin.—The Medical Research Council of Great Britain draw attention to their prophecy in their annual report for 1922-23 that "insulin will prove to have an importance for physiology far beyond that of its use in the treatment of diabetes." This prophecy has received ample fulfilment.

Dr. Best and Dr. J. Hoet of Louvain have been working in collaboration with Dr. Dale and his colleagues at Hampstead, and joint investigations have been undertaken into the fate of the glucose which disappears from the circulation under the action of insulin. The conclusion provisionally arrived at is that insulin not only promotes the storage of circulating glucose as glycogen, but has a restraining influence on the new formation of carbohydrate in the liver. On this conception, therefore, the action of insulin in excessive doses is merely an exaggeration of that which it exerts in physiological and therapeutic amounts. As an incidental outcome of this

work on insulin, phenomena have been observed by Dr. Hoet and Mr. H. P. Marks which have an important bearing on the nature of *rigor mortis*, and by implication, therefore, on the chemical changes which result in muscular contraction. Workers with insulin have often observed that an animal dying from an overdose becomes rigid with remarkable rapidity. Dr. Hoet and Mr. Marks found that the same precipitate onset of *rigor mortis* occurred in rabbits which died after daily administration of thyroid substance for some weeks. The common factor was the practically complete exhaustion of the muscle-glycogen, and the consequent failure to rebuild the hexosephosphate or "lactacidogen."

They found that such glycogen-free muscles enter into rigor with their reaction still alkaline—an observation already made, indeed, by Claude Bernard in 1879, but apparently overlooked in the recent development of theories of contraction and rigor.

COMMERCIAL PHARMACEUTICAL PREPARATIONS*

2.—BELLADONNA ROOT

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THE source of the drug belladonna is *Atropa Belladonna*, Linné, a well-known, tall branching herb bearing characteristic purple, bell shaped flowers and large shining black berries. It is to be found wild in shady sylvan glades throughout the north temperate zone, chiefly in Europe and is now being cultivated successfully in Southern England and in the United States. Fresh and dried leaves and flowering tops, seeds, fruit and root have all been used by the medical profession during the past few centuries but the parts most in demand at the present time are the dried root and dried leaves and tops.

The preparations of belladonna root which appear in the British Pharmacopœia, 1914, are:—

- Liquid extract (0.75% alkaloid)¹
- Liniment (0.375% alkaloid)²
- Plaster (0.25% alkaloid)³
- Ointment (0.6% alkaloid)⁴
- Suppositories, each containing about 1/60 grain of alkaloids⁵

Previous to 1914, the tincture⁶ and dry extract⁷ were also derived from the root. In the Pharmacopœia of the United States, the only article prepared from this part of the plant is a fluid extract.⁸

In response to our request for liquid extract, liniment, unspread plaster and ointment, we received in all from various cities and towns throughout the Dominion, twenty-nine samples of liquid extract of belladonna root, fifty-two of liniment, six of plaster and only one of ointment, which was labelled "U.S.P." and therefore contained the substance of the leaves; in addition, six samples of the old tincture official in 1898, appeared in the collection.

LIQUID EXTRACT OF BELLADONNA

The liquid extract is the key to all the galenicals prepared from belladonna root official

* The second of a series of papers on this subject.
1.—Nux Vomica, *Canad. M. Ass. J.*, July, 1927, xvii, 803-807.

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in 1914. It is the starting point from which all the others are directed to be prepared. This policy was the outcome of a proposal put forward by Barclay⁹ and amended by Cripps¹⁰ who submitted that a concentrated liquid extract containing 0.75 per cent of total alkaloid was a perfectly stable preparation and would prove to be a great convenience as an intermediate. This extract he proposed to prepare by a process of repercolation, so as to obtain without exposure to heat a liquid rich in mydriatic properties. The idea was incorporated in the Pharmacopœia of 1898 and with the exception of changes in the tincture and dry extract was continued in 1914. Thus liquid extract of belladonna differs from the usual preparation of this type in that it represents per fluid aliquot considerably more, on the average, than one part of the drug. Inasmuch too, as the manner of preparation does not aim at complete exhaustion of the drug, this galenical differs from the fluid extract of belladonna root of the United States Pharmacopœia, which provides for complete extraction by the usual macero-percolation process and a potency (0.45 per cent alkaloid) corresponding to that of raw material of moderately good quality.

According to White,¹¹ when the official process has been faithfully carried out in detail, the product should be of a deep, sherry colour. This statement is true when drug of fair quality is employed, but, unfortunately, a good deal of the drug coming into this country is not of good quality. Unfortunately, too, our Pharmacopœia does not specify any minimum standard for the root as our neighbours have done (0.45 per cent alkaloid) and so the colour and consistency of liquid extracts must necessarily depend to a considerable extent upon the quality and condition of the raw material. The preparation does, in fact, vary a very great deal; indeed so disquietingly as to call for comments by physicians and patients. Nevertheless, departures from the prescribed directions, such

as evaporation of weaker percolates and use of menstrua low in alcohol, will result in products containing an excessive amount of inert matter, which will detract from their elegance. They will be dark-coloured, of thick consistency and liable to deposit because water dissolves from the root mucilaginous and albuminoidal matters. Judging from the number of samples open to this criticism, it is to be feared that our Canadian manufacturers have overlooked these considerations; they seem to have followed the American practice in making a complete extraction. It should be borne in mind that the American product possesses only 60 per cent of the potency of the British Pharmacopœia preparation and is not employed for the manufacture of any other preparation. In these circumstances, the proportion of inert substances is not so vital and the question whether heat has any sinister effect upon belladonna alkaloids is still an open one. Even although the British Pharmacopœia process does not bring about complete exhaustion of the root, the method should not on that account be dismissed as uneconomical, for the marcs can be expressed hydraulically or the alcoholic liquor remaining in the drug displaced by means of water. The liquors from percolators Nos. 1, 2 and 3 could be set aside for moistening the next batch and that from No. 4, if strong enough, for appropriate adjustment to produce the official liniment.

The results of the work done on the twenty-nine samples are detailed in Table A. It will be noticed that they have ranged in strength from 0.043 per cent to 1.125 per cent of total alkaloid, the strongest being as much as 29 times that of the weakest. Only three (10 per cent) came within the official limits of 0.7-0.8 per cent total alkaloids: six were overstrength, two slightly so and four decidedly so: eight fell as far as 25 per cent below what is required and the remaining twelve (41 per cent) contained less than 0.5 per cent alkaloids. Two of these fell within the American range of 0.405-0.495 per cent but, beyond being labelled "fluid extract", neither was identified as "U.S.P."

The revised method of assay, in which the resin acids are removed by preliminary extraction with chloroform, presented no difficulty and good checks were frequently obtained. In

carrying out the final titration the pharmacopœial directions were explicitly followed.

LINIMENT OF BELLADONNA

Belladonna root was introduced into British pharmacy about 1860 by the late Peter Squire for the preparation of an anodyne liniment. This he made by a process of macero-percolation which was included in the British Pharmacopœia of 1885. The adoption of Cripps' suggestion in 1898 already alluded to, has resulted in the substitution of the old method by a process of dilution, which is still official.

The liniment is half the strength of the liquid extract and contains 5 per cent of camphor. Allowing for the range of error permitted for the parent preparation, the liniment should contain between 0.35 per cent and 0.40 per cent alkaloid. The colour should be more or less that of sherry, but naturally depends entirely on the liquid extract from which it has been made. Our samples have not only varied enormously from pale amber to very dark brown, but some were actually bright green. The latter had obviously been prepared from leaf extracts instead of root extract, and this fact serves to illustrate the confusion that has arisen from careless labelling and from certain manufacturers supplying an unofficial leaf extract on all unspecified orders for fluid extract of belladonna. Again, one consequence of the free use of the expression "fluid extract" to describe a British liquid extract, is shown in the number of liniments that are just about half the strength of fluid extract of belladonna root of the United States Pharmacopœia.

Of the fifty-two samples examined, twelve (23 per cent) were passable, thirteen were within 20 per cent of the correct figure, one being too strong; two more were also too strong and the remainder all decidedly low. Ten had apparently been made from American extract and four from fluid extract of leaves. On the whole, however, the results are better than those of the liquid extract for the extremes of variation are not so great.

BELLADONNA PLASTER

Belladonna plaster, B.P., is prepared by incorporating concentrated liquid extract in resin plaster. Resin plaster is virtually a mixture of resin and oleates of lead and sodium. The strength is now 0.25 per cent alkaloid.

No official directions are given for the assay of this plaster; merely a statement of its strength. The method adopted was that described by Squire¹² which consists of precipitating the lead from the dissolved plaster by means of sulphuric acid, removing by filtration through a Buchner and extracting the alkaloids from combined filtrate and washings along the usual lines.

Only unspread plaster was asked for by our inspectors and the fact that but six samples came in, indicates that belladonna plaster is not extensively used in Canada. Judging from the catalogues, ready spread plaster does not appear to be manufactured very extensively in our land,

supplies coming mainly from the United States. It is to be noted that the Belladonna plaster official in U.S.P. (Xth) contains extract of belladonna corresponding to not less than 0.25 per cent and not more than 0.30 per cent of the alkaloid of belladonna leaves. The figures in Table C reveal that only one was of correct British strength; two were about 20 per cent low; two were 33 per cent too strong and one very much below standard. The plaster should be appraised less stringently than other preparations of belladonna, for there is a very real difficulty in ensuring a perfectly homogenous mixture, and a great temptation to mix at too high a temperature.

TABLE A
LIQUID EXTRACT OF BELLADONNA

No.	Labelling	Appearance	Total percentage of Alkaloids	Percentage discrepancy from B.P. 1914	Remarks
1.	F. E. Belladonna Root....	Deep brown: sediment	0.933	+24.4	Twice strength of U.S.P. (Xth.)
2.	F. E. Belladonna Rad. B.P.	Deep brown: clear	0.441	-41.3	Pass as U.S.P. (Xth)
3.	Fluid Extract Belladonna Root. B.P. (prepared strictly in accordance with the British Pharmacopœia).....				
		Deep brown: clear	0.818	+ 9.0	
4.	Liq. Ext. Belladonna.....	Deep brown: bright	0.737	-	B.P. 1914.
5.	F. Ext. Belladonna Root....	Deep brown: cloudy	0.498	-33.6	Passable as U.S.P. (Xth).
6.	Fluid Ext. Belladonna.....	Deep brown: cloudy	0.318	-57.6	Decidedly weak.
7.	Fld. Ext. Belladonna Root..	Deep brown: bright	0.590	-21.3	
8.	Fl. Ext. Belladonna Root....	Deep brown: bright	0.234	-68.8	Very poor.
9.	Fl. Ext. Belladonna Root....	Deep brown: bright	0.817	+ 8.9	
10.	Ext. Belladon. Rad. Fl....	Deep brown: bright	0.383	-48.9	Decidedly weak.
11.	Fld. Ext. Bellad. B.P.....	Normal, but very pale	0.603	-19.6	
12.	F. E. Belladonna.....	Dark brown: cloudy: contains chlorophyll	0.655	-12.7	
13.	Fl. Ext. Belladonna.....	Brown: clear: a little light in colour	0.592	-21.7	
14.	Fl. Ex. Belladonna.....	Dark brown: cloudy: contains chlorophyll	0.451	-39.9	Pass as U.S.P. (Xth).
15.	Same as No. 3.....	Deep brown; clear	0.579	-22.8	
16.	Fluid Extract Belladonna Root.....	Dark brown: bright	0.600	-20.0	
17.	Fluid Extract Belladonna Root, B.P.....	Deep amber brown: bright	0.791	-	B.P. 1914.
18.	Fluid Extract Belladonna Root.....	Reddish brown	0.362	-51.7	Decidedly weak.
19.	Extrait Liquide Belladonna 0.4%.....				
		Brown: clear	0.376	-49.9	Pass as specified.
20.	Fl. Ext. Belladonna.....	Brown: bright	0.311	-58.5	Decidedly weak.
21.	Ext. Fl. Belladonne.....	Dark brown: cloudy	0.178	-76.3	Very poor.
22.	Fld. Ext. Belladonna Root..	Deep brown: clear	0.042	-94.4	Very poor.
23.	Ext. Fl. Belladonna Root..	Very dark brown: cloudy	0.559	-25.5	
24.	Fl. Ext. Belladonna Root B.P.....				
		Brown: bright.....	0.289	-61.5	Very poor.
25.	Fl. Ext. Belladonna.....	Dark brown: cloudy	0.599	-20.1	
26.	Fluid Extract Belladonna Root.....	Very dark brown: thick	0.882	+17.6	Twice strength of U.S.P. (Xth).
27.	Fld. Ext. Bellad. Root....	Dark brown: cloudy	1.125	+50.0	Error in adjustment.
28.	Fluid Extract Belladonna Root.....	Deep brown: clear	0.882	+17.6	Twice strength of U.S.P. (Xth).
29.	Fluid Extract of Belladonna Root.....	Dark brown: cloudy	0.707	-	B.P. 1914.

TABLE B
LINIMENT OF BELLADONNA

No.	Labelling	Appearance	Total percentage of Alkaloids	Percentage discrepancy from B.P. 1914	Remarks
1.	Lin: Belladonna B.P.	Brown: bright	0.302	-19.5	
2.	Lin: Belladonna	Brown: bright	0.289	-22.9	
3.	Lin: Bellad. B.P.	Brown: bright	0.340	-9.3	
4.	Liniment Belladonna B.P. 1914.	Brown: turbid	0.302	-19.5	
5.	Lin: Belladonna	Brown: bright	0.333	-11.2	
6.	Lin: Belladonna Commercial	Brown: bright	0.244	-34.9	See Note A.
7.	Lin: Belladonna	Brown: bright paler than average	0.257	-24.8	See Note A.
8.	Lin: Belladonna	Brown: bright	0.347	-7.5	
9.	Lin: Bellad: Meth: (in strength identical with Lin. Bellad. B.P.	Pale amber: brilliant. . .	0.177	-52.8	Decidedly weak.
10.	Lin: Belladonna B.P.	Reddish brown: bright	0.315	-16.0	
11.	Liniment Belladonna	Amber brown: pale: deposit	0.215	-42.7	See Note A.
12.	Belladonna Liniment.	Amber brown: pale: deposit	0.242	-35.6	See Note A.
13.	Liniment Belladonna	Dark reddish brown: bright	0.215	-42.7	See Note A.
14.	Belladonna Liniment.	Amber brown: clear	0.080	-78.7	Very poor.
15.	Liniment of Belladonna	Amber: bright	0.320	-14.7	
16.	Lin: Belladonna	Amber: pale: bright	0.213	-43.2	See Note A.
17.	Liniment Belladonna	Brown: bright	0.280	-24.0	
18.	Belladonna Liniment.	Deep brown: bright	0.362	-	B.P. 1914.
19.	Lin: Belladonna	Very dark: turbid	0.356	-	B.P. 1914.
20.	Liniment Belladonna	Red brown: bright	0.390	-	B.P. 1914.
21.	Lin: Bellad:	Red-brown: bright. . .	0.164	-56.3	Decidedly weak.
22.	Liniment Belladonna	Brown with green tinge, contains chlorophyll	0.205	-45.3	See Note A.
23.	Liniment Belladonna B.P.	Brown: brilliant	0.170	-54.7	
24.	Lin: Belladon:	Red-brown: bright	0.260	-30.7	
25.	Liniment Belladonna	Deep brown: bright	0.374	-	B.P. 1914.
26.	Linimentum Belladonnae ..	Brown: bright	0.318	-15.2	
27.	Lin: Belladonna	Amber: brilliant contains trace of chlorophyll	0.142	-62.1	
28.	Lin: Belladonna B.P.	Dark brown: deposit	0.243	-35.2	See Note A.
29.	Liniment Belladonna	Red-brown: bright: trace of chlorophyll	0.340	-9.3	
30.	Liniment Belladonna B.P. ..	Golden: bright	0.362	-	B.P. 1914.
31.	Lin: Belladonna, B.P.	Red-brown: bright	0.426	+13.3	
32.	Liniment of Belladonna	Dark brown: clear	0.567	+51.2	Very strong.
33.	Liniment Belladonna B.P. ..	Red-brown: brilliant	0.299	-20.3	
34.	Liniment of Belladonna	Red-brown: bright	0.305	-18.7	
35.	Lin: Belladon:	Brown: bright	0.293	-21.8	
36.	Lin: Belladonna	Red-brown: bright	0.372	-	B.P. 1914.
37.	Lin: Belladonna	Green: brilliant	0.116	-69.1	Very poor: not B.P. See Note B.
38.	Liniment Belladonna	Amber brown: bright	0.105	-72.0	Very poor.
39.	Liniment de Belladone	Amber: brilliant	0.329	-10.9	
40.	Belladonna Liniment	Brown: bright	0.394	-	B.P. 1914.
41.	Lin: Belladonna	Red-brown: bright	0.289	-24.3	
42.	Lin: Belladonna	Green with brown tinge: turbid	0.065	-82.7	Very poor, not B.P. See Note B.
43.	Liniment Belladone	Deep green: turbid	0.197	-47.5	Decidedly weak. Not B.P. See Note B.
44.	Liniment of Belladonna	Brown with green tinge	0.112	-70.1	Very poor: not B.P. See Note B.
45.	Lin: Belladonna	Deep red-brown: turbid	0.304	-18.8	
46.	Liniment Belladonna	Red-brown: bright	0.376	-	B.P. 1914.
47.	Lin: Belladonna	Red-brown: bright	0.387	-	B.P. 1914.
48.	Lin: Belladonna	Red-brown: bright	0.174	-53.6	Decidedly weak.
49.	Liniment Belladonna	Red-brown: bright	0.376	-	B.P. 1914.
50.	Lin: Belladonna	Dark red-brown: turbid	0.457	+21.8	Made from ext. twice U.S.P. strength.
51.	Liniment of Belladonna B.P.	Very dark red-brown: turbid	0.405	+8.0	Passable as B.P.
52.	Belladonna Lin.	Deep red-brown: turbid	0.260	-30.7	

Note A.—Prepared from liquid extract of strength of U.S.P. (Xth).

Note B.—Apparently made from a leaf preparation.

TABLE C
BELLADONNA PLASTER

No.	Labelling	Total percentage of Alkaloids	Percentage discrepancy from B.P. 1914	Remarks
1.	Emp. Belladonæ.....	0.331	+32.4	Rather strong.
2.	None.....	0.328	+31.2	Rather strong.
3.	Belladone for plaster.....	0.202	-19.2	
4.	Emplast. Belladonna.....	0.093	-62.8	Decidedly weak.
5.	Emplastrum Belladonna.....	0.261	-	B.P. 1914.
6.	Emp. Belladonnæ.....	0.200	-20.0	

TABLE D
TINCTURE OF BELLADONNA ROOT

No.	Labelling	Appearance	Sp. Gr.	Total percentage of Solids	Total percentage of Alkaloids	Percentage discrepancy from B.P. 1898	Remarks
1.	Tr. de Belladonna....	Amber: bright	0.922	1.32	0.058	+16.0	
2.	Tr. Belladonna B.P. 1898.....	Amber: bright	0.920	1.32	0.055	+10.0	
3.	Tinct. Belladonna Rad. B.P. 1898....	Amber: bright	0.915	1.73	0.069	+38.0	Decidedly strong.
4.	Tincture Belladonnæ Root.....	Pale amber bright	0.907	1.73	0.029	-42.0	Decidedly weak.
5.	Tr. Belladonna.....	Very pale yellow	0.890	0.24	0.003	-99.4	Exceedingly poor.
6.	Tinct. Belladonnæ British Pharmacopœia.....	Brown: clear			0.023	-54.0	Decidedly weak.

TINCTURE OF BELLADONNA, B.P., 1898

This preparation was not asked for, but six samples came in, presumably furnished in response to requests for tincture of belladonna and only three were correctly labelled.

This tincture is one fifteenth of the strength of the liquid extract and should contain from 0.048-0.052 per cent alkaloid, as compared with 0.035 per cent in the leaf tincture presently official.

A glance at Table D will disclose a sorry state of affairs: not one single sample is correct. Besides exceedingly great variations in colour and potency, there is evidence in the figures for total solids, either of poor selection of raw material or of improperly prepared extract.

To say the least, this form of preparation is archaic and the standard should be regarded as obsolete. Even if the article as sold conforms in composition to the professed standard

under which it is sold, there is very little justification for its existence.

In view of the confusion existing because of the several names of the various preparations (Tincture of Belladonna, B.P., Tincture of Belladonna, U.S.P., Fluid Extract of Belladonna, Liquid Extract of Belladonna) prescriptions should specify definitely which is desired—and it is the duty of manufacturers and dispensers to pay greater attention to the quality of the preparation used in dispensing.

BIBLIOGRAPHY

1. British Pharmacopœia, 1914, p. 123.
2. *Ibid.*, p. 205.
3. *Ibid.*, p. 117.
4. *Ibid.*, p. 436.
5. *Ibid.*, p. 373.
6. British Pharmacopœia, 1898, p. 338.
7. *Ibid.*, p. 102.
8. Pharmacopœia of the United States. Tenth Decennial Revision, 1926, p. 162.
9. BARCLAY, *Pharmaceutical J.*, 3rd series, xxiii, 740-742.
10. CRIPPS, *Ibid.*, xxv, 793-796.
11. WHITE, *Ibid.*, 4th series, xii, 106.
12. SQUIRE, Companion to the British Pharmacopœia, sixth Ed., p. 281.

PARINAUD'S CONJUNCTIVITIS WITH SUPPURATION IN THE PREAURICULAR, SUBMAXILLARY AND SUPRACLAVICULAR GLANDS*

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IN the *Centralblatt für Augenheilkunde* for November, 1882, Goldzieher under the title *Lymphadenitis conjunctivæ*, cites the case of a fourteen-year old boy, who had recently been brought to him with a history that for ten days the right eye had been swollen, and during the same period the preauricular gland had been enlarged.

Examination showed the gland in front of the right ear swollen to about the size of a pigeon's egg. There was also a large submaxillary glandular swelling, and a small one on the same side of the throat. The lower lid of the right eye was slightly swollen; the bulbar conjunctiva was oedematous and moderately injected. Pulling down the lower lid, one saw in the outer part of the conjunctival fold a tumour the size of a hazel nut, the surface of which had a distinct yellowish appearance. There was no sign of ulceration anywhere. The consistency of the swelling was similar to a primary syphilitic induration. There was no trace of trachoma seen. The ophthalmoscopic and the vision tests were normal and the lungs were free.

As regards diagnosis, Goldzieher thought first of a primary tuberculous lesion, from the appearance of the cheesy swelling in the conjunctiva, and from the coincident glandular swelling. He proceeded to take a piece for microscopic examination, and details of this report are given. Goldzieher concluded that his case was one of lymphadenitis conjunctivæ. At the end of his article, he mentions two similar cases, reported to him by colleagues. In the first, that of a scrofulous child with carious bone disease, there was found a general glandular swelling, associated with nodes in the conjunctiva, which were partly cheesy and contained pus. The child later died of meningitis.

The second case was a young adult of eighteen years, with a swollen left lower lid. In the fornix of the conjunctiva was found a yellowish grey abscess, which was covered with purulent discharge. Goldzieher looked upon all three cases as a true lymphadenitis in a scrofulous affection of the conjunctiva.

In 1889, Parinaud, before the Ophthalmological Society of Paris, gave a report on an infectious form of conjunctivitis, which he believed was transmitted from animals to the human eye. From the report in the *Recueil d'Ophthalmologie* the following is taken:

Parinaud stated that he had noticed during the last four years three cases of ocular infection, which he did not think, to date, had been reported. It commenced as an infectious form of conjunctivitis, which always caused glandular swelling, and seemed to be transmitted from animals to man. In all three the condition was monocular. At first it looked like a granular conjunctivitis. The conjunctiva was bordered with red and yellowish growths, transparent and later opaque, and about the size of large pin heads. Besides these were much smaller yellowish ones. In one case the granulations were limited to the tarsal conjunctiva of the upper lid, in the other two, both lids were affected. There was no involvement of the cornea. The lids were swollen, hard to the touch, with nodules which might be taken for chalazions. The surrounding parts quickly became involved, the inflammation extending to the neck, where the glands became swollen and later suppurated. Fever was present in all the cases. After four or five months the conjunctival inflammation tended to suddenly resolve, leaving no scars behind. The swelling of the parts around the conjunctiva diminished toward the fifth week, but the glandular swelling persisted. The first disappeared by absorption, the second suppurated.

The suppuration of the glands which showed the infectious nature of this complaint, constituted an essential characteristic of the disease. While glandular swelling may be common in infections of the eye, their suppuration on the contrary is quite rare. The presence of the small yellowish granules suggested tuberculosis of the conjunctiva, but the course and spontaneous recovery, eliminated all uncertainty in this respect. In all three cases there were no signs of tuberculosis nor syphilis.

In case number two, owing to the unusual appearance of the ocular affection, and to the development of the lymphangitis, which extended to the base of the neck, an animal infection was suggested, which was more than probable as the patient was a butcher's wife.

The third case confirmed this supposition. The disease was found in a child five years old, who lived in an old house of one story where there was a meat

* Read at the meeting of the American Ophthalmological Society, Quebec, June, 1927.

shop. This being a rag-picker's dwelling, one can easily imagine the unhygienic conditions existing in it. To enlarge upon this important point of etiology, he completed his remarks on the first two cases, which were women. He was unable to trace the first. The second, as he has said, was a butcher's wife, and still bore the two scars made by the glandular abscess. She told him that her husband had caught the same infection. He adds that this woman suspected that the disease was caught from the meat, but had not told her husband this, through fear of being worried by the inspectors. Parinaud believed that this would prove to be the beef lymphangitis recently reported by M. Noeart. The probable transmission through the meat in the market, its relative benignancy, its resemblance to tuberculosis warranted this supposition.

Following Parinaud's report, there are found in the literature numerous reports of "The infectious conjunctivitis of Parinaud," or "Infectious conjunctivitis of animal origin." In many of these the evidence of animal origin is very slight, and the clinical picture hardly warrants placing the cases in the category of Parinaud's conjunctivitis.

In 1898, Gifford commented as follows, on five cases of Parinaud's conjunctivitis:—

"The main characteristics of the conjunctivitis as described by the French, are a sudden onset, with great thickening of the lids, muco-purulent discharge, formation within a week or two of large, frequently polypoid, and pedunculated granulations, on the tarsi, on the folds, or on both, and sometimes on the ocular conjunctiva. Between these larger granulations, there sometimes occur numerous smaller yellowish ones. Almost immediately after, or, very rarely, before the development of the conjunctivitis, there occurs sudden inflammation of one or more of the groups of lymph glands, on the same side; the pre-auricular and retromaxillary group being most frequently involved, though sometimes both these, and the cervical and submaxillary are affected. The affection of the lymphatics is generally marked, the swelling being sometimes enormous, and suppuration occurring frequently. With the onset of the disease slight rigors and fever with general depression sometimes occur. The disease is always one-sided, showing no tendency to spread to the second eye, nor to other individuals, with whom the affected person may come in contact. Left to itself it generally undergoes a spontaneous cure, in from two to six months. Parinaud considered the affection to be of animal origin, and he with other French authors, have adhered to this idea, upon very scanty premises."

In 1913 Verhoeff published his article on "Parinaud's conjunctivitis—A mycotic disease due to a hitherto undescribed filamentous organism." In eleven out of twelve consecutive cases, each having the clinical features described by Parinaud, and each presenting essentially the same characteristic histological picture, a minute filamentous micro-organism was found. He stated the characteristic feature of the disease was the occurrence of focal areas varying in size

and shape and infiltrated with endothelial phagocytes in various stages of necrosis.

In 1924 Lemoine reported a case in which he found the micro-organism described by Verhoeff, and in 1926 Dunphy reported two cases in which the lesions were typical and contained the leptothrix described by Verhoeff. Whilst Parinaud's original description of the clinical condition was most accurate, he did not make any histological examination. A number of the later reports of other investigators have dealt very thoroughly with this side of the disease.

On this point Verhoeff writes as follows:—

"Every case in the entire series showed the histological picture which I have shown to be characteristic of this conjunctival disease alone. The essential lesion is a focal area 0.3 m.m. in diameter or larger, densely packed with endothelial phagocytes loaded with broken down chromatin granules, which is situated just beneath the epithelium. These areas I have referred to as areas of cell necrosis. This term may have given rise to misconception, since it may have been understood to refer to areas of necrosis similar to those of tuberculosis, although I have taken pains to explain to the contrary. Perhaps it would be better to term the lesions areas of endothelial phagocytosis. The explanation of these areas became obvious when I finally found within them leptothrices in large numbers. The endothelial phagocytes are evidently attracted by the leptothrices, since they invade the masses of the latter, and since they frequently contain many of the organisms, a fact which I have previously neglected to mention. Many of the phagocytes show various stages of necrosis due, evidently, to the toxic action of the organisms; the resulting cell detritus being taken up by the newly arrived phagocytes. This process is so extensive that it is difficult to find in the lesions an endothelial leucocyte which is free from chromatin fragments. The endothelial phagocytes seem to be derived chiefly from the endothelium of the conjunctival lymph spaces, for the cells of the latter can be seen in all stages of active proliferation, while the spaces themselves are distended with the phagocytes. The endothelial cells never form Langhan's great cells in the areas of necrosis. The chief variations I found were in the size of the areas of the cell necrosis, and in the amount of granulation tissue that was formed as the result of the reaction around them. In the older cases there was a considerable number of pus cells in addition to the endothelial phagocytes in the lesions. Surrounding the areas, the tissue in all cases was densely infiltrated with chronic inflammatory cells, among which the plasma cells largely predominated.

Although a number of positive bacteriological findings were made in Parinaud's conjunctivitis, the etiology remained obscure until 1913, when Verhoeff made a notable contribution. In eleven out of twelve consecutive cases, with the same histological picture, Verhoeff reported the finding in the tissue of a minute filamentous organism. The filaments were present in large irregular masses, from 10 to 60 μ in diameter, within or near the areas of cell necrosis, which were especially prominent

just beneath the epithelium. He also found them in the superficial lymph spaces and this according to Verhoeff explains the early involvement of the regional glands. The individual filaments were extremely delicate, about the diameter of the *B. influenza*, and varied in length from a few to 30μ . They were either straight, or irregularly curved or bent. They were demonstrated only by using a modified Gram's stain,* when regularly distributed granules could be made out. No branching of the filaments was observed.

Verhoeff suggested that it might be classed as a leptothrix, and later suggested the name "Leptothricosis Conjunctiva" for the condition.

Animal inoculations were made by Verhoeff in six cases all with negative results. Cultures were likewise negative. In 1918 Wherry and Ray reported the cultivation of a leptothrix from a case of Parinaud's conjunctivitis.

Later in the course of the human case, a similar organism was isolated on egg yolk directly from the pre-auricular gland. Wherry and Ray conclude that the organism grown by them was probably, though not certainly, identical with that found in sections by Verhoeff.

REPORT OF CASE

A young colleague, Dr. G. A. F., consulted me on November 4, 1926, complaining that for about two weeks, during which time he had been feeling miserable, his right eye had been inflamed with the lids quite swollen. He had also noticed that the cervical, pre-auricular, and sub-maxillary lymphatic glands were enlarged. Examination showed the right eye markedly inflamed, the palpebral and bulbar conjunctiva being quite oedematous. It was noted that while the conjunctiva was intensely inflamed there was comparatively little discharge. In the retrotarsal fold there were seen a number of well marked opaque areas beneath the epithelium. These areas had a distinct greyish yellow tint. There was no history of trauma; no association with animals, and apart from the conjunctival disturbance there was nothing abnormal about the eye. Examination by

smear in the ordinary way gave a negative result. Epithelial cell smears were then made, and stained for tubercle bacilli, trachoma bodies, and eosinophile cells. These examinations were negative except that in one of the smears were found here and there in the cytoplasm of the epithelial cells, tiny diplococci, which in morphology resembled closely streptococci. They were not numerous but occurred here and there in four or five of the cells. Media inoculation was practically negative. A piece of the conjunctival tissue was then taken for microscopic examination.

The clinical features which diagnosed the condition Parinaud's conjunctivitis, were that it was ushered in with a systemic disturbance, (fever), only one eye was involved, the neighbouring lymphatic glands were prominently swollen, while the above-mentioned areas in the conjunctiva, especially those in the retro-tarsal fold had a characteristic appearance. The conjunctival inflammation ran a benign course, and with the daily cauterization with 1 per cent silver nitrate, the condition cleared up in about six weeks' time. The course of the glandular inflammation extended over a much longer period. It was on October 17th that the right eye became inflamed, and one week later the upper cervical glands on that side were swollen and tender. Then followed the pre-auricular and supra-clavicular. It was not until December 4th that the sub-maxillary glands became involved. Most of the lymphatics of the upper lid, and three-quarters of the lower, drain into the pre-auricular, and then into the cervicals, while the other portions drain directly to the sub-maxillary.

In each case the glandular infection ran on to severe swelling, suppuration, and drainage. On January 20th, nearly three months after he came to observation, the submaxillary glands had to be drained.

Pathological Examination.—The section taken for examination included epithelium, and sub-epithelial tissue. The most striking lesion was found just beneath the epithelium, where in the cellular granulation were found areas of acute necrosis, in which here and there were seen degenerating endothelial cells with chromatin granules and inter-cellular substance, not grouped as in Verhoeff's illustration but scattered. The main mass contained comparatively large blood vessels while at the edge of the tissue were seen numerous thin walled newly formed capillaries, widely dilated and within the lumen polymorphs and lymphocytes. These vessels appeared as endothelial lined spaces. Oedema was present, more marked in the superficial layers than the deep. The cells making up the infiltration in the subepithelial tissue were mostly plasma, with small lymphocytes here and there. Polymorphonuclear-leucocytes were only rarely seen and eosinophiles not at all. Among the well formed infiltrating cells numerous degenerated

* The special method of staining is as follows:—
(1) Stain lightly in hematoxylin and eosin, mount in Canada balsam and examine under the microscope. Select only sections which show areas of endothelial phagocytosis. After five minutes or longer, remove cover slip by aid of heat, and wash off excess of balsam with xylol, chloroform, 95 per cent alcohol, water. (2) If celloidin section, place on slide, wipe off excess of water. (3) Stirling's gentian violet 12 minutes. (4) Water. Remove from slide of celloidin section. (5) Lugol's solution 1:2:100 20 seconds. (6) Water. (7) 95 per cent alcohol in small dish 15 seconds. (8) Oil of origanum in dish, 15 seconds. (9) 95 per cent alcohol 30 seconds. (10) Oil of origanum. Place on slide and blot. (11) Wash off thoroughly with xylol and blot. (12) Xylol-balsam.

ones were seen in varying stages of degeneration. Sections were stained by Verhoeff's modification of Gram's stain and a search made for the leptothrix with a negative result. Frequently fields were seen wherein it was thought leptothrices were present, but closer examination showed them to be degenerated elastic fibres.

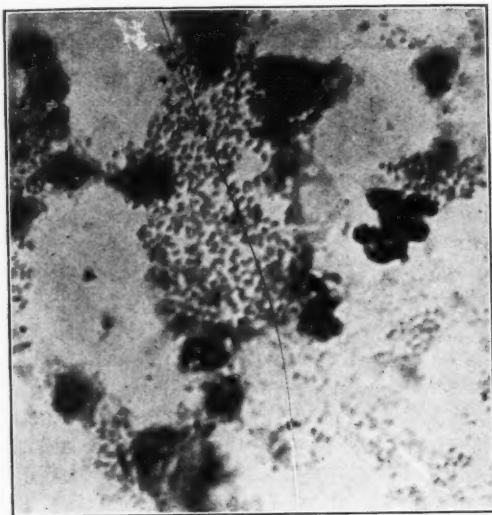


FIG. 1.—A Gram negative bacillus in the pus from the submaxillary gland.

An observation of some interest was made from the pus of the submaxillary gland. In smear preparations the slides were found filled with a Gram-negative bacillus, which, however, we were not successful in cultivating. This bacillus 1μ long by $\frac{1}{2}$ wide in size and appearance was similar to *B. coli communis*. In another case an observation of interest is that in the areas of necrosis were found many bacteria along the edge, some in clumps apparently within phagocytes. These seemed to be in the nature of diphtheroid bacilli. Deeper in the same fragment and in other fragments, there were found lighter stained filaments, that formed a reticulum which, I believe, is characteristic of fibrin. The

bacilli held the Gram stain strongly, and presumably a Gram-positive leptothrix should show up equally well. "I can readily see where there would be a temptation to connect the bacilli and the fibrin filaments," writes S. B. Wolbach.

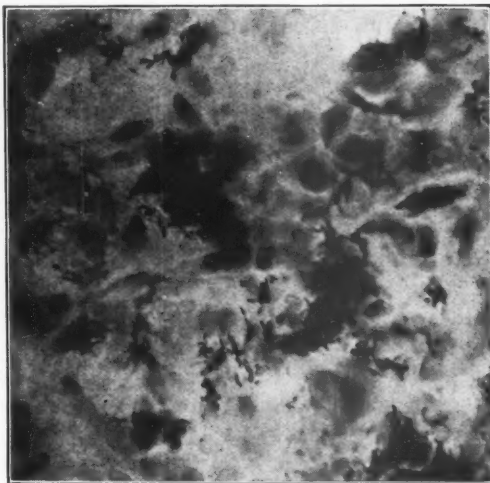


FIG. 2.—Diphtheroid bacilli in the tissue of the conjunctiva.

REFERENCES

1. GOLDZIEHER, W., *Centralb. fur Augenh.*, 1882, p. 321.
2. PARINAUD, *Societe d'Oph. de Paris*, Feb. 5, 1889; *Recueil d'Ophthalmologie*, xi, 176.
3. ROHMER, *Ann. d'Ocul.*, 1894, p. 360.
4. GIFFORD, H., *Am. J. Ophth.*, 1898, xv, 193.
5. DOYNE, *Lancet*, 1903, xi, 1298.
6. CHAILLOUS, *Ann. d'Oculist*, Jan., 1904, p. 5.
7. VERHOEFF AND DERBY, *Arch. of Ophth.*, 1904, xxxiii, 389.
8. MATYS, *Zeit. f. Augen*, Oct., 1904, p. 551.
9. SCHOLTZ, *Arch. f. Augenh.*, 1905, lv, 40.
10. ELLETT, *Ophth. Rec.*, Jan. 9, 1905, p. 193.
11. VERHOEFF AND DERBY, *Klin. f. Augenh.*, 1905, p. 705.
12. HOOR, *Klin. f. Augenh.*, 1905, liii, 40.
13. BERNHEIMER, *Klin. f. Augenh.*, 1906, xlv, 323.
14. GOURFEIN, *Rev. Med. de la Suisse Romande*, Feb. 20, 1907.
15. VERHOEFF, *Arch. Ophth.*, 1913, xlii, 345.
16. VERHOEFF, *Am. J. of Ophth.*, Oct., 1918.
17. WHERRY AND RAY, *J. Infect. Dis.*, 1918, xxii, 554.
18. PASCHEFF, *Brit. J. Ophth.* viii, 25.
19. DUNPHY, *Am. J. Ophth.*, Sept., 1926.

Acute Cardiac Dilatation.—J. H. Clark, Philadelphia, reports three deaths occurring in patients shortly after intravenous injections of 10 per cent dextrose solution, and one after physiologic sodium chloride solution. Of the two patients receiving dextrose solution, each experienced chills about twenty minutes after the injection. Their pulses became irregular and feeble, and they died within four and nine hours after the injection. One had received previous injections of dextrose solution without exhibit-

ing such phenomena. Intravenous therapy is not the innocuous procedure it is generally considered, and the cases illustrate the necessity of carefully choosing patients for the intravenous administration of drugs, particularly when large amounts of fluid are to be given. If the injection is given slowly and a careful watch is kept of the pulse and cardiac condition, by frequent blood pressure determinations made during the injection, such fatalities should be preventable.—*Jour. Am. Med. Ass.*, July 2, 1927.

THE THOMAS' KNEE SPLINT

SUGGESTED ALTERATIONS OF DESIGN

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THE Thomas' knee splint which has been so widely and so successfully used in the treatment of fractures of the femur, might seem almost to be above criticism. However, the writer believes that many of its most enthusiastic advocates have noted defects in its design and have been compelled to resort to various stratagems in order to overcome these or even at times to make use of other appliances in cases where, at first sight, its use seemed particularly indicated.

At present the splint is supplied by the instrument makers in two general designs: (a) having a transverse or (b) an obliquely placed ring. Both of these may have an "adjustable" ring in which an adjustment of the ring in one plane only (the vertical) is obtained. Very often, however, even this adjustment is lacking; the appliance then being rigidly constructed in every plane.

The ring itself is circular, is padded properly and describes within its circumference a single plane. A common modification is the "half-ring" which is always transverse and rigidly attached to the leg pieces. It differs from the original full ring chiefly in that it is more easily applied, i.e., the splint may be slipped under the fractured limb instead of being drawn up over it as in the case of the full ring. The leg pieces may be of fixed length or adjustable in total length by means of an ensheathing upper or lower division with set-screws to maintain them at any desired length. The leg pieces converge from their points of origin at the ring to the rigid cross piece at the foot. Anti-toe-drop and foot-rest attachments are furnished with some models. The proposed *modus operandi* of the splint is that the ring should be fixed upon the tuber ischii, altogether in the case of the transverse ring, and upon the tuber ischii and thick muscles of the buttock in the oblique model, and that the counter-traction force should be transmitted to the pelvis at these points. In practice, however, it is fre-

quently found that the patient cannot bear the pressure necessary to obtain adequate traction. This happens not so much because the parts mentioned are unable to withstand pressure, but rather because of the difficulty or impossibility of really applying the pressure to them or, having so applied it, of keeping it there. The ring slips off the tuber ischii and slides upwards onto the ramus of the ischium and the descending ramus of the pubes. The counter-traction force then comes to bear on the sharp inferior edge of these bones, the areas of origin of the adductor muscles, or external genitals, all of which are sensitive and quite unsuited to withstand pressure. In fact the areas which are well adapted to this purpose lie in the opposite direction. They are: (a) the tuber ischii, and (b) the thick pad of muscles with their strong fascial coverings which lie in that area running upward and backward from the tuber ischii to the region of the post-superior iliac spine, thence curving forward below the crest of the ilium to the vicinity of the anterior superior spine. It is evident that the bony prominences of the ilium, the pubes and the area overlying the femoral vessels and nerves must be guarded against pressure.

In order to have a generally efficient splint it is necessary, first, that the ring shall be capable of comfortably transmitting a very considerable amount of pressure to the pelvis and, second, that it shall remain fixed in this favourable position through all the adjustments which the requirements of the case may demand of the rest of the splint, such as elevation, abduction, eversion, etc. The difficulty or impossibility of accomplishing these things seems to me to constitute the defects of the splint in its present design.

If one should pass a piece of lead tape below the tuber ischii, bringing it up about the pelvis over the areas adapted to withstand pressure, it will be found that the outline described is ap-

proximately heart shaped (apex below). The "ring" thus moulded will possess at least two planes, an anterior and a posterior, which diverge sharply from each other. This divergence may amount to 50° or 60° . The inferior and medial surfaces of the tuber ischii lie in the anterior, while the other pressure bearing areas reside in the posterior plane.

In any case the tuber ischii must be utilized as the chief point on which to fix the ring and here the ring should conform as nearly as possible to the contour of the part. If at the same time this rounded apical curve should be bent forward, so as to take somewhat the form of a broad retractor, it would then "grasp" the tuber ischii more surely than would be the case with a single plane ring. The adoption of a moulded ring of this type would make it necessary to have two sets of rings for each splint (right and left) but in view of the increased efficiency which I believe would be given to the splint, this does not seem to be an important objection. The general form could be standardized quite readily and could be altered slightly as might be necessary for the individual case. I did not find it difficult to make such a ring and, after it had been padded, it appeared to be a much more comfortable appliance than the one now in use.

But even admitting that the circular single plane ring is not a serious defect in the present design, there remains the much more important matter of the "adjustability" of the ring to the varying degrees at which the pelvic plane meets the long axis of the thigh.

The angle varies:

- (a) noticeably in different individuals with the leg in the long axis of the body.
- (b) within wide ranges in the same individual in the various positions of adduction or abduction of the thigh.

If the ring is to remain fixed on the pelvis as proposed above, it must be made so that it can be adjusted on the leg pieces through an arc of about 90° in a horizontal plane (extreme adduction to extreme abduction), and for purposes of elevation through an arc of at least 45° in a vertical plane. Then, too, it must be readily detachable from the leg pieces so as to permit the appliance to be used on either limb, and lastly, each leg piece must be able to *rotate* freely about its own long axis, at the point of attachment to the ring. The reason for this last re-

quirement will be seen when the matter of obtaining inversion or eversion of the fractured limb is being discussed.

The whole problem of supplying such an adjustable ring rests in the device used to attach the ring to the leg pieces. I made use of the following: two pieces of $\frac{1}{4}$ inch iron pipe, 4 inches in length were flattened for $1\frac{1}{2}$ inches at one end. The flattened section of each was drilled quite near the end with a $\frac{3}{8}$ inch drill, the ends rounded off, etc. The inside of the remaining circular portion of each was then reamed out with a $\frac{3}{8}$ inch drill so that it would give a nice working fit over the end of the ($\frac{5}{16}$ inch) leg piece. The ring itself was made from $\frac{1}{4}$ inch soft iron bar. The ends were not welded but a piece of thin walled pipe about $1\frac{1}{4}$ inches in length, machined out, so as to fit the ends of the ring tightly, was prepared to act as a "union". The two small attachments were then slipped over the ends of the ring. The ring was closed by forcing the ends into the union. The attachments were held in place opposite each other on the circumference of the ring by the padding which was buttressed up on both sides of each attachment, leaving the ring itself bare, between the buttresses, for a distance of perhaps $\frac{1}{2}$ inch. These interruptions in the partially padded ring were then bridged over by further layers of padding, so that the pelvis would be protected from injury while allowing at the same time every freedom of movement to the attachments on the ring.

A few "alignment axioms" concerning fractures of the thigh seem in order here before resuming the discussion of the remainder of the splint. In any given fracture of the femur, in order that correct alignment may be obtained, it will be necessary to place the limb below the fracture site in one of a number of positions. These are: (a) in the long axis of the body; (b) adducted or abducted; (c) flexion upon the body; (d) a vertical, inverted or everted position of the leg, relative to its own sagittal plane will be required in combination with one or more of the above: (e) flexion of the knee upon the thigh.

Several experiments were made in order to have a flexible knee piece included in the design of the proposed splint but so far without success. (See *Surgery, Gynecology and Ob-*

stetrics, Aug., 1926, for Digby's very excellent article on this problem.)

Traction of varying degrees will be necessary in practically all cases and this must be exerted in such a way as not to interfere with the position in which the limb has been placed.

The Thomas' splint does not seem to be well designed to maintain these various positions. For instance, eversion or inversion can be obtained by rotating the ring on the pelvis, but this manoeuvre will at once interfere with adequate (or at least comfortable) traction. Other instances can be given, but perhaps reference to the diagrams below will make the defects apparent.

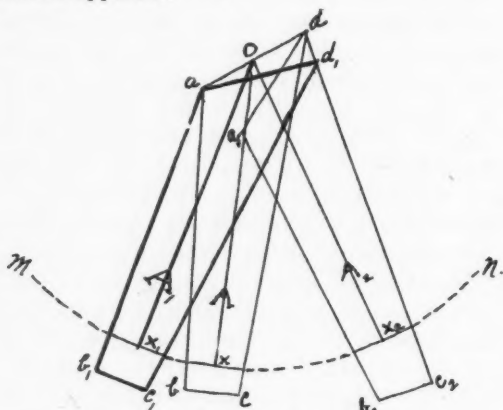


DIAGRAM I

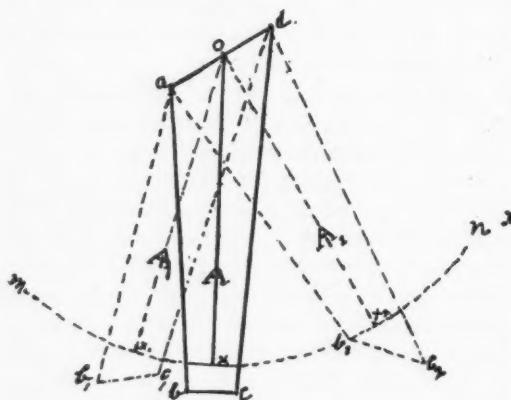


DIAGRAM II

Illustrating the positions of the limb in a horizontal plane, relative to long axis of the body and the behaviour of rigid or adjustable splints in the different positions.

A, A₁, A₂—Neutral, adducted, abducted positions of limb.

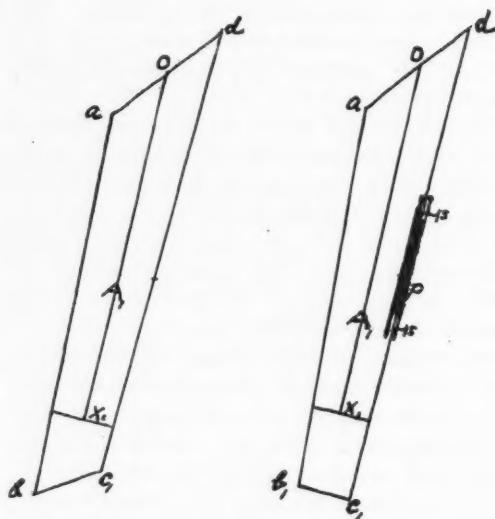


DIAGRAM III

- o —Acetabulum.
- abcd; etc.—Thomas' splint applied to limb in positions A, A₁, A₂.
- ad —Ring of Thomas' splint.
- bc —Cross piece at foot of splint.
- x —Moveable foot piece.
- mn —Arc traversed by foot in moving through various positions.

Diagram I, shows that a ring not adjustable in a horizontal plane must tilt about on the pelvis in adduction (A₁), or abduction (A₂); Diagram II, that when the ring remains fixed on the pelvis the contour of the foot of the splint must change in a very undesirable way unless some device is introduced (Diagram III) in one or the other leg piece which will allow their relative lengths to be changed. For a special reason which will appear below and because of its accessibility this device has been introduced in the external leg piece. The external leg piece has been divided; a portion equal to the difference in lengths of the external and internal leg pieces has been removed from the upper section; a piece of pipe having set screws (s) (s) has been placed as a bridge between the divided ends. By means of this device the relative lengths of the leg pieces can be altered readily and can be maintained in any desired relation by means of the set screws.

The alterations in the design of the splint so far suggested will, I believe, meet all requirements so far as adduction or abduction in the

horizontal plane of the body is concerned. There remain the positions of flexion, inversion and eversion or combinations of these with those already mentioned.

The behaviour of the splint when any attempt is made to place the limb in a position of flexion is most interesting. As the splint is raised it becomes adducted and at the same time rotated internally. A little consideration will explain this rather disappointing behaviour and will at once make apparent the necessity for some further change in design.

The splint (Position A) has limbs of unequal length, each of which during elevation must move about separate points in a common plane and since both limbs must move together, the only paths through which these combined movements can take place are those which describe concentric cones. In practice this would have the effect of adducting and inverting the lower segment of the fractured limb. The exact movements can be expressed in geometrical terms, but from a practical standpoint it is sufficient to note that they vary in degree with the relative lengths of the leg pieces. In the average case (Position A), elevating the splint 45° from the horizontal plane will invert the lower fragment 45° and adduct it 22.5° from its original position.

At any given point of elevation in actual practice it would be quite possible to overcome undesirable adduction by shortening the external limb. The splint rapidly swings outward, but while inversion in that plane is also rapidly diminished it does not disappear until the two limbs become of equal length. By that time the leg would be widely abducted from the mid-line and quite possibly in an undesirable position so far as correct alignment is concerned. On the other hand it might be desirable to maintain the limb in adduction but in a vertical or even an everted position, so that it becomes necessary to have in reserve another adjustment which will permit the movement of inversion or eversion to take place independently of the lateral movements.

This is accomplished in the following way (Diagram IV): the contour of the body of the splint is changed. The internal leg piece, cross piece, and external leg piece up to the point of division (Diagram III) describe in their course, so far, a rectangular figure. The lengthening

device (illustrated also in Diagram III) is bent at a point about 2 inches from its lower end. A piece of iron rod ($\frac{3}{4}$ inch long) is placed inside the pipe and rivetted there *at the site of the angle* (T). This is to prevent the ends of the leg pieces from "wedging" in the angle when the inverting or everting mechanism comes into action. The pipe sleeve is machined to fit the leg pieces smoothly, i.e., a "working fit"—and set screws of powerful design are placed near each end for locking the splint in the desired position. A curve may be made near the upper end of the external leg piece, so as to protect the great trochanter from pressure.

On the lower parallel section of the leg pieces a moveable platform (P) is mounted. This carries a foot piece (X) at right angles to the long axis of the splint. Both platform and foot piece are strongly constructed and are capable of withstanding great stress either of traction or of torsion.

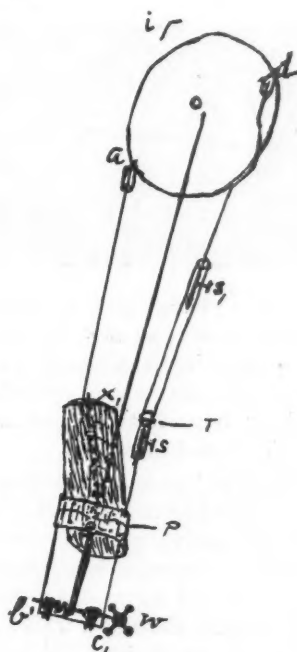


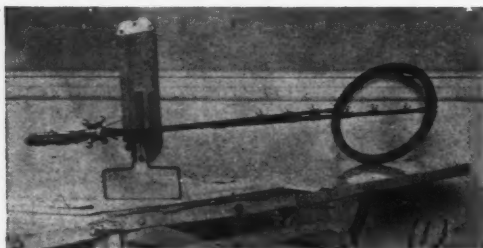
DIAGRAM IV

As a convenient method for obtaining traction a small windlass is mounted on the leg pieces at the extreme lower end of the splint. A wire cable of small diameter (picture cord) connects the windlass with the moveable platform. (Perhaps it would be better to retain the spreader of the Buck's Extension, placed below the foot piece

with the straps passed up on either side of it to connect with the ends of the leg straps and utilize the foot piece for its primary duties only—as an anti-toe-drop appliance and for the purpose of imparting inversion or eversion to the leg.) The windlass itself can be locked every $\frac{1}{4}$ turn and is capable of exerting extremely powerful traction. A force of 10 pounds applied on the arms of the windlass should exert (in this model) a "cross bar" force of about 80 pounds.

Diagram IV shows also the circular ring with the attachments at (a) and (d) which will permit the adjustments considered necessary in that part of the splint.

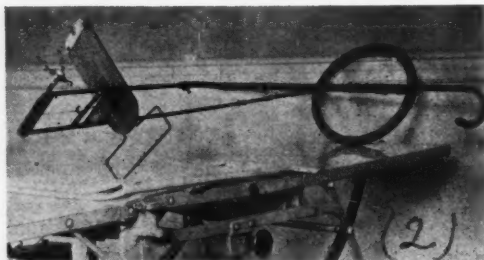
In the paragraphs immediately above, the changes in design necessary to obtain independent inversion or eversion of the fractured limb have been described. The mechanism of this is perhaps of sufficient interest for special comment.



The effect of dividing the external leg piece and the introduction of an *angled* sleeve at this point, is to convert the former single plane body of the splint into one having *potentially* two planes which can be made to move on each other by rotating the angled sleeve.

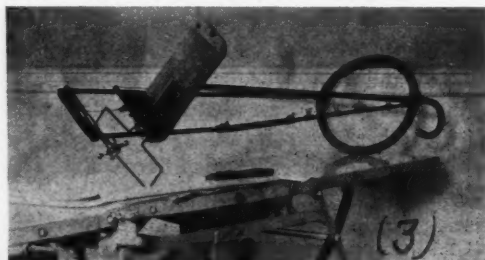
In the "neutral" position the apex of the angle in the sleeve points toward the fractured limb and the foot piece rests in a vertical plane. When the sleeve is rotated it is apparent that if the upper end of the external leg piece were free to move it would describe a wide circle, but since this is prevented by its attachment to the ring, the rotatory movement is transmitted to the *lower* end. This end carries with it the whole remaining portion of the splint with its foot piece and gives to the latter a pronounced rotatory movement which centres at the point of attachment of the *internal* leg piece to the ring. With the knee extended and the foot at right angles to the tibia the leg becomes a rigid

column and hence all that portion below the site of fracture must follow the rotatory movements (of inversion or eversion) imparted to the foot piece.



The photographs show the finished splint in (1) neutral, (2) inverted, and (3) everted positions. The cane placed across the splint in (2) and (3) shows that the rotatory movement of the foot piece takes place without any alteration of the position of the ring. The angled sleeve makes possible a total rotatory movement of about 90° which is probably more than would ever be required.

The splint is applied as follows: The ring is passed up the leg and applied to the pelvis—the rest of the splint is placed in position. Broad strips of sheeting cut in proper lengths are passed under the upper and lower leg and over the leg pieces of the splint and held in position by clips. Ordinary paper clips (25 cents the dozen) which have been modified by having the central portions bent so as to grip the leg pieces, answer the purpose very nicely.



The foot piece is now adjusted to the foot and the foot is bandaged to it. The side straps of the Buck's Extension are brought down in *front* of the leg pieces and fastened under the foot piece immediately in *front* of the moveable platform (or as suggested above, to the spreader which then will rest on the platform *below* the

foot piece). The cable is attached to the windlass through which in turn any desired degree of traction may be exerted on the leg.

For the transportation of a fracture case, a wide based foot rest is provided to steady the limb and this may be satisfactory for the permanent treatment of the case; but if not it may be detached and the splint suspended in the position desired.

In conclusion the writer wishes to state that he has had no experience with the splint described above, but has so far approached the subject from a theoretic standpoint only. It appears that the alterations suggested are practicable and in accordance with sound mechanical principles and that therefore their adoption will add something at least to the general usefulness of this well known appliance.

HEREDITARY ABNORMALITIES OF THE EYE*

V. INHERITABLE DEFECTS OF THE IRIS AND LENS

By MADGE THURLOW MACKLIN, M.D.

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THIS group of affections is a very important one inasmuch as it furnishes a large percentage of the cases which are found in the schools for the blind. Turning again to the records of one of the largest of such schools in Canada we find that 18 per cent of the pupils being taught there are afflicted with diseases of the iris and lens which are ordinarily recognized as being inherited. Thus pupils suffering from blindness, or very defective vision, due to coloboma of the iris form 2 per cent of the total attendance; those with aniridia or practically complete absence of the iris comprise 3 per cent, and those whose sight is impaired due to cataract constitute 13 per cent of all the pupils. With such figures, we see the importance of recognizing the part which heredity plays in furnishing pupils for our institutions for the blind, even when we allow for those few cases of these affections which are attributable to no heredity, evident or obscure.

When we recall, too, that many patients with hereditary cataract, which forms the largest group mentioned above, are never entered as pupils in the schools, since they develop the

condition at a period long past that of the school age, we become more and more impressed with the necessity for education of our profession and the laity as to the need for stopping the tragic increase of blindness through inheritance.

Of the diseases which affect the iris which show unmistakable evidence of being inherited, coloboma iridis or a defect in the iris, and aniridia, or irideremia as it is sometimes called, form the two most important ones.

From both anatomical and hereditary evidence, it would appear that aniridia is merely a more complete lack of iris tissue than is coloboma, and not a separate and distinct defect. Clausen⁸ states that there is always some trace of iris in even the most complete cases of aniridia and there are pedigrees reported of families in which the two conditions were interchangeable in the matter of inheritance.

ANIRIDIA

Cunningham⁹ records a family in which the defect of aniridia had existed through four generations, having been present in the male in the first generation, in his daughter in the second, four other children being unaffected; in two sons of this daughter in the third, four of her children being normal, and in two daughters of one of these sons in the fourth generation, six other offspring possessing normal irides.

* Part I, Laws of heredity and their exemplification in the inheritance of eye colour, *Canad. M. Ass. J.*, Nov., 1926, xvi, 1340. Part II, Inheritable defects involving the eyelids and their mode of transmission, *Ibid.*, Jan., 1927, xvii, 55. Part III, Anomalies of the entire eyeball, *Ibid.*, Mar., 1927, xvii, 327; April, 1927, xvii, 421. Part IV, Inheritable diseases affecting the conjunctiva, *Ibid.*, June, 1927, xvii, 697.

This pedigree shows a break in the line of descent in one place. Two sons with aniridia were born to a normal son of the male in the first generation, thus making the defect skip a generation. Inasmuch as this defect appears to be comparable to brown eye colour in its mode of transmission, that is, it is dominant and does not skip a generation, we may question the accuracy of the information. The defect may have been present in the father of these two boys, but to a much less extent than in the rest of the family, so that it was not noticed, or the person who furnished the history may have been incorrectly informed as to the condition in the family.

Laserew and Petrow²¹ record aniridia in a father and daughter; Page³⁴ (Fig. 14) reports a family in which aniridia combined with microphthalmus, microcornea, ectopia lentis and nystagmus had affected a woman, three of her six children and a granddaughter. Since each affected person inherited the entire group of defects, it is reasonable to assume that the factors for all of them were present in one and the same chromosome. Clausen⁸ also records a family in which aniridia, combined with glaucoma, cataract, and nystagmus had occurred through three generations, affecting both sexes and being transmitted in the direct line of descent. He also mentions a number of pedigrees reported by other observers of this condition in which it had been passed on through two and three generations.

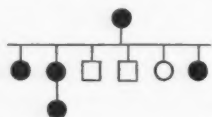


FIG. 14.—Pedigree showing transmission of microphthalmus, nystagmus and coloboma through three generations. Squares indicate males, circles females, and black symbols affected members. After Page.

The family whose history is mentioned by DeBeek¹¹ (Fig. 15) is of great interest, because in this the conditions of coloboma and aniridia were interchangeable. The brother with coloboma had a son with aniridia, while the brother with aniridia had a son with coloboma, who in turn had a daughter with aniridia. Thus in this pedigree, the two conditions appear to be the same, differing only in the degree to which iris tissue is lacking.

Perhaps the most striking pedigree reported

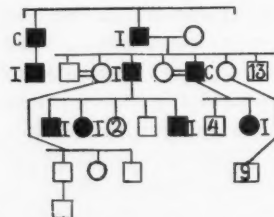


FIG. 15.—Pedigree showing interchangeability of coloboma of the iris and aniridia in inheritance. C means coloboma; I means aniridia; = means twins; clear symbol with numeral inside indicates a corresponding number of unaffected offspring. After DeBeek.

on this subject is that furnished by Risley,³⁶ (Fig. 16). In this family there was no information available concerning the first two persons in the chart, so that the condition can be traced only to their son who showed aniridia. He had, as the chart shows, 13 children all of whom showed his defect. From these 13 children were sprung 63 grandchildren, 61 of whom showed no iris, most of them lacking it in both eyes. In the fourth generation, there were 42 members, all children of an aniridic parent, and of these, 39 had aniridia. Thus in this family the defect occurred in 96 per cent of the cases, as against the usual 50 per cent which would be expected. The discrepancy here is so great as to call for

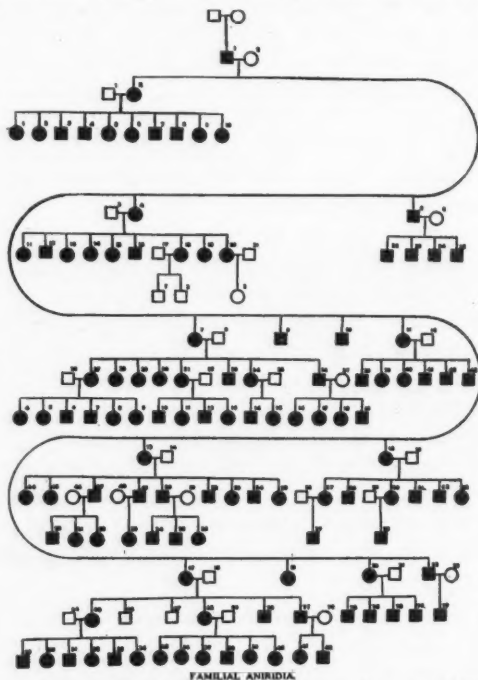


FIG. 16.—Pedigree showing inheritance of aniridia. This is a very remarkable history, inasmuch as it shows 96 per cent of the offspring affected. After Risley.

some explanation, for the families were by no means small, so that the law of chance would have opportunity to produce approximately equal numbers of affected and unaffected, since the mates in all of these marriages are listed as being normal.

There are two explanations that occur at once, the second, to my mind, being the more likely. The first is that in this family there may have been several factors for aniridia in different chromosomes in the germ cells, any one of which, if present, would produce aniridia, so that the chances of inheriting the condition would be greatly increased. The second and more probable explanation is that there was a tendency either to remember or report only those members who showed the defect. We are much more impressed with the abnormal than with the normal and tend to remember it more clearly. Hence the normal members of this family may have been omitted from the record.

COLOBOMA IRIDIS

This, like aniridia appears to be due to a dominant factor, so that it is not transmitted by those free from it. Blair and Potter,⁴ Lewis,²² Theobald³⁸ and Mittendorf²⁶ have recorded coloboma of the iris through two generations; while Loeb²³ and Snell³⁷ have found it running through five generations, affecting both sexes and acting as a simple dominant character. The conditions of coloboma iridis and aniridia appeared to be interchangeable in the families reported by Lewis,²² Theobald³⁸ and DeBeek¹¹ (Fig. 15).

The only pedigree of coloboma which appears to indicate that it may be due to a recessive factor is that of Hessin.¹⁰ Here five children in a family of ten were afflicted with coloboma of the iris and the choroid. Both parents were recorded as being normal, and there was no history of eye defects known in the ascendants. This may mean that coloboma and aniridia, although acting as a dominant character in some families, may be due to a recessive factor in others, or it may mean that the defect in the parents involved only the choroid and so passed unobserved.

It has been noted that occasionally coloboma or absence of part of the lens, choroid or retina may be found in conjunction with coloboma of the iris. This has been explained by most writers on the subject as follows: if the foetal

optic fissure fails to close in any part or along its entire length, a defect is found in the adult at the site of failure of the closure. Hence one would expect to find that coloboma of the iris would often be associated with defects in the lens, choroid or retina. Moreover, it might happen that in different members of the same family, the defect might occur at varying sites along the optic cleft, thus causing coloboma of the iris in one, and coloboma of the retina in another. It is rather astonishing that the site of the defect is as constant as it is. For explanation of the unusual cases reference must be made to the literature.³

Heterochromia iridis, or different colouring in the two irides, has been reported as occurring in several members of the same family. The pedigree of this peculiarity which is furnished by Gossage¹⁶ is of a family in which the defect had lasted through five generations, affecting the great-great-grandfather, the great-grandmother, the grandmother, an uncle and his daughter, an aunt and her son, and the mother and her daughter. Calhoun⁶ records his own cases in which there was evidence of paralysis of the cervical sympathetic. The resultant degeneration of the nerve accounted for the difference in pigmentation. The cause of the paralysis is not mentioned, although it seems that this and not the heterochromia iridis is the primary factor in Calhoun's family. The grandmother, father, son and two male cousins of the latter, sons of a paternal aunt and a paternal uncle, both of whom had normal eyes, were the affected members in Calhoun's family. In this article is mentioned Osborne's case in which fifteen brothers, six sisters, their mother, three sisters and one brother of the mother and the maternal grandmother all showed the same difference in colouring in the two irides. The suggested mode of transmission is the dominant, although Calhoun's pedigree does not altogether substantiate this.

ECTOPIA LENTIS

Congenital displacement of the lens naturally interferes markedly with vision, so that the person suffering from this defect is at a great disadvantage. Numerous family histories have been placed on record showing the hereditary character of this condition. Most of the pedigrees indicate that this anomaly is due to a dominant factor; thus Adams²¹ history shows

it as present in a mother, two sons and five daughters, two daughters being normal; Parker³⁵ reports it in a grandmother, mother and three children, and mentions numerous other pedigrees; four, in which it was present through two generations, three, in which it existed in three generations, and one in which it had been traced through five, practically always acting as if due to a dominant factor. Wilder's³⁹ pedigree is of ectopia lentis through three generations; Marcinkus²⁵ is of ectopia lentis through three generations, combined with posterior polar cataract in the cases examined.

Spontaneous luxation of the lens, not congenital, has been noted as occurring in a family for over a century affecting fifteen of thirty males and three of twenty-six females, (Vogt, cited by Clausen⁶).

If the displacement affects the lens only, it appears to follow the rule for the transmission of dominant characters, that is, not to appear in a family without any hereditary history. If in addition to the lens being displaced there is an anomalous position of the pupil, the mode of inheritance may follow the rule for the transmission of recessive characters. For example, Hosford²⁰ cites the case of a family in which six of the seven children suffered from misplaced pupils and lenses. Both parents had normal pupils and lenses. Fig. 17 gives the pedigree recorded by Clausen⁶ in which five of ten children born of normal parents showed this condition of pupil and lens. The family history on both sides for several generations was clear as far as eye defects were concerned. In this family and in Hosford's, the parents both carried the recessive factor for the defect. The matings are comparable to Mating VI, Table I.²⁴

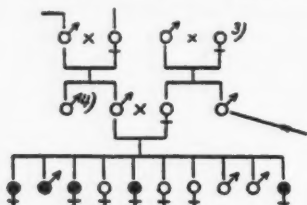


FIG. 17.—Pedigree showing occurrence of ectopia lentis and pupillae in a family whose ascendants showed no eye defects. Suggestive of recessive type of character. Circles with arrows mean males, with plus sign females. After Clausen.

Fig. 18 on the other hand gives the transmission of ectopia lentis and pupillae as being of the direct or dominant type for the most

part. The only exception here is that the female listed as unaffected in the second generation had two sons who showed the defect. The probabilities are that the defect was present but to a slight extent in her.

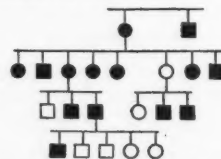


FIG. 18.—Pedigree showing dominant type of transmission of ectopia lentis and pupillae, the only exception being the unaffected female in the second generation. After Siemens (cited by Clausen.)

CATARACT

There are many types of cataract, and all of them furnish strong evidence of being inherited. Congenital cataract has been noted through five generations by Adams,² through four by Harman,¹⁸ and by Nettleship and Ogilvie²⁷; coralliform cataract has been recorded by Fisher¹⁵ through two, and by Nettleship through three³¹ generations; presenile cataract by Davenport¹⁰ through four, and by Nettleship³² through five generations; posterior polar cataract through four generations by Ziegler and Griscom⁴⁰; lamellar cataract through four generations by Nettleship³⁰; zonular cataract through two generations by Derby¹²; discoid or Coppock cataract through four generations by Nettleship²⁹; through two by Chance⁷ and by Dorrell¹⁴; and cataract presumably of the senile type through six generations by Green¹⁷; through four by Nettleship³³ and through three by Dickey,¹³ by Brown,⁵ and by Nettleship.²⁸

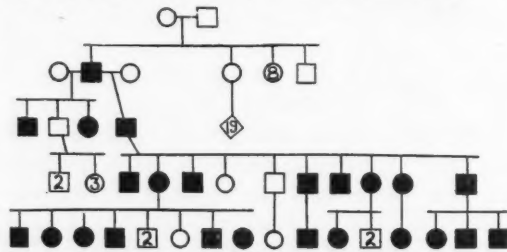


FIG. 19.—Pedigree showing inheritance of cataract as a dominant character. Cataract of lamellar variety. Note affected male in second generation whose offspring by two wives developed cataract. After Nettleship.

These few pedigrees are by no means all that have been compiled showing the inheritance of cataract. They all agree in two points, namely, that the type of cataract remains fairly constant throughout the generations which have been ex-

amined, and that it is due to a unit dominant factor. Fig. 19 gives Nettleship's pedigree of lamellar cataract through four generations. With the exception of the two members of the first generation, concerning whose sight nothing was known, the defect was not passed on by those not exhibiting it.

In Fig. 20, also from Nettleship, this does not hold true, since A is listed as clear, yet her son and daughter had cataract. Again B is shown as free from the defect, yet his two daughters developed cataract. This does not vitiate the rule that hereditary cataract does not develop in the offspring of those who are really free from it. Inasmuch as this defect may arise at any time from birth to extreme old age, it is readily conceivable that a parent who would have developed cataract had he lived longer, passed on the factor for cataract to his children and died before he himself gave any evidence of possessing the defect. Again in some types of cataract, the opacities may be so small and scattered as not materially to lessen the vision, and the patient may be aware of them only when examined by a competent ophthalmologist. They would thus be counted as clear by relatives giving the family history.

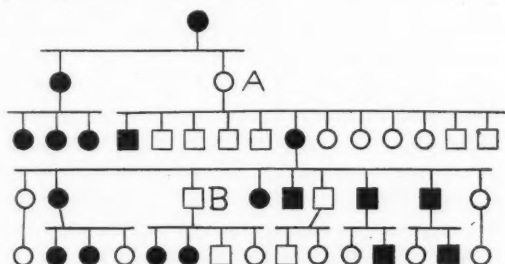


FIG. 20.—Pedigree showing inheritance of cataract as a dominant character with the exception of A and B who did not show the defect, but whose offspring did. See text for explanation. After Nettleship.

In reviewing the above list of defects in the iris and lens we are impressed with the number of persons affected as evidenced by the percentages of pupils affected by them in our schools for the blind, and with the serious results which they cause. In view of this what should be our attitude in instructing patients afflicted with them?

Because coloboma of the iris may be transmitted to the child as complete aniridia, and because it is so apt to be associated with defects in the lens, choroid or retina, all of the latter being very serious, every patient with either

coloboma of the iris or lens, or aniridia, should refrain from reproducing. This applies equally to males and females, who alike transmit to both sexes. The rule given by Davenport cannot be accepted here as the pedigrees do not support it. His rule suggests transmission of sex linked characters but as the records show, coloboma is neither sex-linked and recessive nor sex-linked and dominant. Davenport¹⁰ says, "No female with the coloboma defect should have children since *all* sons will be defective in the structure of the pupil. For males with the defect, the danger in marriage is also great, for either all or half the sons of such a father, although married to a woman from a normal strain, will be defective, but the daughters will not be defective in this respect unless the wife belongs to a strain with this defect." Yet he says that coloboma is due to a "positive", that is, a dominant character.

Reference to Fig. 14 will show the first part of the statement to be incorrect. The mother in the first generation had coloboma of the iris, also she had two sons *neither* of whom showed her defect, although Davenport says that *all* sons of such a woman will exhibit coloboma. As to the transmission through males, the statement is again erroneous as Fig. 15 shows. The male twin in the second generation was mated to a normal female. He had the defect of coloboma of the iris yet *none* of his sons inherited it and his daughter did. This is contrary to Davenport's rule, for at least two of the sons should have had the defect and the daughter should have been free. Davenport wrote that rule over sixteen years ago, and he would no doubt alter it a great deal if rewriting it in the light of knowledge that has been gained since then. Coloboma is apparently like brown eye colour, and the two pedigrees given in Figs. 14 and 15 are readily intelligible in the light of Mating V in Table I.²⁴

With respect to ectopia lentis, if the lens be completely displaced, the sight may be corrected by the proper lens, but it is never as efficient as it should be. Patients suffering from this defect should not have children, and since it appears to be recessive in some families, normal parents who have had one child showing the defect should have no more offspring.

Cataract is again a thing concerning which it is difficult to make a rule. Operation may re-

lieve the condition, but the patient may not have the money for any surgical assistance whatever, or may get incompetent service, losing his sight in either case. Certainly those who suffer from cataract before they reach the marriageable age should not reproduce. For those who are members of a cataractous family in which the opacity develops late in life, it becomes, I suppose, a matter of individual conscience, since they cannot tell until too late to rear a family whether or not they are to be victims of cataract. They should know two things, however, the first being that the cataract tends to develop at an earlier age in the children than it did in the parents, and that cataract, despite its operability furnishes as many as 13 per cent of the pupils in the institutions for the blind.

Ten years ago, Loeb, writing the history of a family with cataract was impressed with the necessity of eliminating blindness due to hereditary causes. This last winter I noted a report from a little mining village in West Virginia, where the good hearted miners contributed of their savings to send the two daughters, aged 22 and 24, of a fellow miner to Baltimore to have removed from both eyes cataracts which had caused total blindness since their birth.

How long are we going to leave in ignorance those who may be the progenitors of defective children? How long are we to allow those who hold such tragic potentialities within them, either unwittingly or with full knowledge, to pile still higher the ever increasing numbers of those who are denied, because of their inheritance, the chance to be normal beings?

Commercial *Bacillus Acidophilus* and *Bacillus Bulgaricus* Cultures and Preparations.

—In summarizing the results of his survey, Lawrence H. James, New Haven, Conn., directs attention to several pertinent facts: (1) The milk cultures showed the highest average counts, the whey cultures next to the highest, and the solid cultures the lowest (omitting the inaccurate results of the semisolid cultures). (2) All samples of one type from any one producer, examined before the expiration date, were more or less similar in quality, regardless of their age. (3) Liquid and solid preparations marketed by the same producer were somewhat similar in quality. (4) Contaminating organisms were more common in solid than in broth or milk cultures. (5) Of thirty-three strains of organisms isolated from cultures claimed to be *B. acidophilus*, nineteen

BIBLIOGRAPHY

- ADAMS, P. H., *Trans. Oph. Soc. U. K.*, 1909, p. 274.
- Ibid.*, p. 275.
- Am. Encyclopædia of Ophthalm., Cleveland Press, Chicago, 1914, iv: article on Coloboma.
- BLAIR, C., AND POTTER, B., *Trans. Oph. Soc. U. K.*, 1903, p. 261.
- BROWN, A. J., *Am. J. Ophth.*, 1924, vii, 36.
- CALHOUN, F. P., *Ibid.*, 1919, ii, 255.
- CHANCE, B., *Ophth. Rec.*, 1907, p. 297.
- CLAUSEN, W., *Zentralbl. f. d. ges. Ophth. u. ihre Grenzgeb.*, 1925, xiii, 1-55.
- CUNNINGHAM, J. F., *Trans. Ophth. Soc. U. K.*, 1909, p. 131.
- DAVENPORT, C., *Heredity and Eugenics*, Un. of Chicago Press, 1912.
- DEBECK, D., *Trans. Am. Ophth. Soc.*, 1894, p. 117.
- DERBY, H., *Ibid.*, 1888-90, 722.
- DICKEY, J. L., *J. Am. M. Ass.*, 1916, lxvi, 2113.
- DORRELL, E. A., *Trans. Oph. Soc. U. K.*, 1911, p. 157.
- FISHER, H., *Ibid.*, 1905, p. 90.
- GOSSAGE, A. M., *Quart. J. Med.*, 1908-09, i, 331.
- GREEN, J., *Trans. Am. Oph. Soc.*, 1888-90, p. 724.
- HARMAN, N. B., *Trans. Oph. Soc. U. K.*, 1909, p. 101.
- HESSIN, *Klin. Monatsbl. f. Augenheilk.*, 1914, liii, 728.
- HOSFORD, S., *Trans. Oph. Soc. U. K.*, 1911, 50.
- LASEREW AND PETROW, *Klin. Monatsbl. f. Augenheilk.*, 1914, liii, 329.
- LEWIS, A. C., *Oph. Rec.*, 1915, xxiv, 134.
- LOEB, C., *Ann. of Oph.*, 1917, xxvi, 573.
- MACKLIN, M. T., *Canad. M. Ass. J.*, 1927, xvii, 421.
- MARCINKUS, J., *Medicina*, 1924, i, 12.
- MITTENDORF, W. F., *Trans. Am. Oph. Soc.*, 1880-84, p. 735.
- NETTLESHIP, E., AND OGILVIE, F. M., *Trans. Oph. Soc. U. K.*, 1906, xxvi, 191.
- NETTLESHIP, E., *Ibid.*, 1908, xxviii, 220.
- Ibid.*, p. 226.
- Ibid.*, 1909, xxix, 188.
- Ibid.*, p. 201.
- Ibid.*, p. 62.
- Ibid.*, (cited by HOWE, L., *Eugenics Rec. Off. Bull.*, 1921, vol. xxi).
- PAGE, H., *Lancet*, 1874, ii, 193.
- PARKER, E. F., *J. Am. M. Ass.*, 1898, xxxi, 708.
- RISLEY, S. D., *Ibid.*, 1915, lxiv, 1310.
- SNELL, S., *Trans. Oph. Soc. U. K.*, 1908, xxviii, 148.
- THEOBALD, S., *Trans. Am. Oph. Soc.*, 1888-90, p. 99.
- WILDER, W., *J. Am. M. Ass.*, 1898, xxxi, 710.
- ZIEGLER, S. L., AND GRISCOM, J. M., *Trans. Am. Oph. Soc.*, 1915-16, p. 356.

showed a possibility of being that organism and fourteen did not; and of fifteen organisms isolated from preparations claimed to be those of *B. bulgaricus*, ten showed a possibility of being that organism and five did not. Therapeutic claims were disregarded in this survey. Of 107 samples examined, thirteen produced the species claimed on the label in reasonably pure form and in satisfactory number. Of the remaining samples, fifteen were sufficiently pure and presented viable organisms in sufficient number to have possible value. The others were worthless as representing cultures of the species claimed. James feels that there is need of revision of the present methods of marketing acidophilus and bulgaricus cultures and preparations.—*Jour. Am. Med. Ass.*, July 9, 1927.

Case Reports

A CASE OF MONGOLIAN IDIOCY OCCUR- ING IN ONE OF MALE TWINS*

By GORDON CHOWN, B.A., M.D.

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Mitchell and Downing¹ have recently reviewed the literature with reference to Mongolian idiocy occurring in twins and have reported a case occurring in one of male twins. They state that a satisfactory description was given in only seven of the twenty-four cases collected from the literature, and an illustration accompanies only five of them. They suggest that in all future reports a description of the patient be given and photographs be presented.

They apparently overlooked the report accompanied by a photograph of Mongolian idiocy in both of male twins by Reuben and Klein.

Assuming Mitchell and Downing's summary to be correct, including the case reported by Reuben and Klein,² and the one to be presented in this report, there have been now twenty-six instances of Mongolism reported in twins. In fifteen of these the condition was present in only one of the children, the other and normal

twin being of the opposite sex in eleven cases; in the remaining four the sex was not stated. In four cases Mongolism occurred in both twins, the sex being identical. In seven cases Mongolism occurred in one of twins of the same sex, in five cases of which there were two placentas present at birth; in the other two the condition of the placenta was not stated. Of the seven cases five occurred in male twins.

CASE REPORT

Baby Jacob.—(Fig. 2) age one year, one of male twins, of Austrian parentage, was admitted to the Winnipeg General Hospital August 26, 1926, from the Immigration Hall.



FIG. 2.—Baby Jacob. The Mongolian.



FIG. 1.—Mother, father and twins.

* Read before the fifth annual meeting of the Canadian Society for the Study of Diseases of Children, Toronto, June 13, 1927.

Complaint.—Fever, cough and diarrhoea of four days duration.

Family History.—Mother 31 years. Father 34 years. No history of syphilis, tuberculosis or alcoholism. No miscarriages.

Birth History.—First pregnancy; full term; instrumental labour. Birth weight unknown.

Mother definitely asserted that Baby Jacob was born two days later than Baby Peter, the normal twin, and that instruments were necessary to effect delivery.

Physical Examination.—Weight 13 lbs. 8 oz. Circumference of head $15\frac{3}{4}$ inches. Length 28 inches. Fontanelle $1\frac{1}{2}$ by $1\frac{1}{2}$ inches. No teeth, unable to sit up, one undescended testicle. Typical Mongolian idiot. Chest showed scattered rhonchi, and stools evidence of an acute intestinal upset. He was discharged ten days later.

Diagnosis.—Mongolian idiot; bronchitis; intestinal upset.

Baby Peter.—(Fig. 3.) With the aid of the social service of the hospital, I was enabled to examine the other twin.

Birth History.—Full term, normal labour. Birth weight unknown.



FIG. 3.—Baby Peter. The normal twin.

Physical Examination.—Weight 20 lbs. 14 oz. Head circumference $18\frac{1}{4}$ inches. Length 30 inches. Fontanelle admits tip of index finger. Two lower central incisors are through the gums. The child sits up; creeps, and is physically and mentally normal for age.

COMMENT

The case presented, especially the birth history, the Mongolian being born two days later than the normal twin—supports the views of McLean,³ Halbertsma,⁴ Strauch,⁵ Mitchell and Downing² that where Mongolism occurs in twins it is the result of a double ovum pregnancy, and that the etiology is due to a defective germ plasm.

Herrman,⁶ while supporting this theory goes further and states that Mongolism is a reversion to a primitive type, or in other words it depends upon the reappearance of recessive unit factors. The former view that the condition is due to exhaustion products: physical or nervous strain, syphilis, alcoholism, consanguinity, conditions operative during pregnancy, (Swanberg and Haynes),⁷ and endocrine imbalance (Pardee),⁸ seem now to be refuted.

I desire to thank Dr. R. F. Rorke, Professor of Pædiatrics, University of Manitoba, for permission to report the case.

REFERENCES

1. MITCHELL, A. G., AND DOWNING, H. F., *J. Am. M. Sci.*, 1926, clxxii, 866.
2. REUBIN, M. S., AND KLEIN, S., *Arch. Pædiat.*, 1926, xliii, 553.
3. MCLEAN, S., *J. Am. M. Ass.*, 1922, lxxviii, 13.
4. HALBERTSMA, T., *Am. J. Dis. Child.*, 1923, xxv, 350.
5. STRAUCH, A., *J. Am. M. Ass.*, 1923, lxxxi, 2181.
6. HERRMAN, C., *Arch. Pædiat.*, 1925, xlii, 523.
7. SWANBERG, H., AND HAYNES, H. A., *Arch. Neurol. & Psychiat.*, 1919, i, 717.
8. PARDEE, I. H., *J. Am. M. Ass.*, 1920, lxxiv, 94.

A CASE OF ACTINOMYCOSIS IN A CHILD EIGHT YEARS OLD

By I. M. LINDSAY, M.D.

Montreal

Eva H., 8 years old, was admitted to the Children's Memorial Hospital, Montreal, July, 1926, complaining of failing health, cough and loss of weight. Her ill health dated back to an attack of pneumonia in October, 1925. Since that time she has not been well. Her appetite has been poor and she has become thin and anæmic. During February, March and April she attended school, but stopped this on account of a "painful cough." This pain has recently become worse and is referred to the right side of the chest and abdomen. She expectorated a moderate amount of muco-purulent sputum. Her

bowels tended to be loose. She feels miserable, tired and "headachy."

Past history.—She was born and always lived in Montreal. She has had measles, pertussis, otitis media and mastoiditis associated with a right-sided facial paralysis. She was always considered a normal healthy child until her present troubles began nine months ago.

Examination on admission.—She was a poorly nourished and developed girl, looking sick and pale. The axillary and inguinal glands were easily palpable; tonsillar nodes enlarged, the tongue heavily coated. There were three carious teeth. The tonsils were submerged. There was a purulent discharge from the right ear.

The chest was rather flat; expansion diminished on the right side; percussion note was flat on the right side below the fourth rib in front and the third rib behind; over this area the breath sounds were tubular in character; no râles or friction rub was heard. The left lung appeared normal. A needle was inserted into the right side of the chest, below the angle of the scapula but no fluid obtained.

The heart was apparently normal and was not displaced.

The abdomen was slightly distended, but moved freely on respiration. The superficial veins were quite distended, especially below the umbilicus. There was a slight resistance to palpation, but no definite tenderness. The spleen was palpable two to three inches below the costal margin. The liver edge was felt about one inch below the ribs. No masses could be felt and no moveable dullness be made out.

The extremities were negative; there was no oedema.

Urinalysis.—Turbid yellow; acid; specific gravity, 1.014; albumin present but no sugar. Pus cells were present ++; there were a few blood discs and a few epithelial and granular casts.

Blood count revealed red cells 3,500,000; white cells 18,000; hæmoglobin 70 per cent.

The Wassermann test was negative.

The Mantoux test was also negative.

X-ray of the chest showed the right diaphragm to be elevated considerably as if pushed up by a mass below. The whole of the lower one-third of the same side of the chest was opaque; quite clear above. The heart was not displaced.

The following conditions were considered as possibly explaining the above symptoms: (1) Empyema; (2) subdiaphragmatic abscess; (3) perinephritic abscess; (4) chronic suppurative otitis media.

On August 16th a resection of part of the eighth rib on the right side behind was done. No fluid was obtained. An incision was then made into the abdomen. The liver was found to be enlarged and on its upper surface a hard nodular mass could be felt. As this was thought to be a sarcoma nothing further was done, save to explore the right kidney which seemed to be normal.

During the next four months the child was kept as comfortable as possible. She had an occasional attack of diarrhoea and occasionally her cough would become troublesome. Her temperature chart showed there was almost constant fever often intermittent in character, being sub-normal in the morning and 101° or 102° in the evening. X-ray of the chest showed a dense shadow in the lower half of the right side, and displacement of the heart to the left.

She became gradually more emaciated and more anæmic while her abdomen became more distended. Free fluid was detected and as much as 1,500 c.c. was withdrawn on one occasion. This fluid was clear yellow; but did not suggest the true nature of the cause which was only discovered at post mortem.

She died on January 2, 1927.

Post mortem examination.—The peritoneal cavity contained a large amount of straw coloured fluid. There was a mass of adhesions between the loops of intestines and the abdominal wall. The cæcum and appendix were especially involved. The diaphragm was densely adherent to the liver. Inferiorly the liver was bound to the right adrenal gland and kidney by a mass of granulation tissue. Multiple abscesses exuding greenish pus were found on cutting the liver, and the right kidney. In the rectum two ulcerated areas with indurated edges were found.

A similar picture was seen on opening the right thoracic cavity. Free fluid, with dense bands of adhesions between the lung, the thorax and the diaphragm, was found. The right lung was collapsed and its pleural surface shaggy with fibrous adhesions. The cut surface resembled liver tissue. The bronchi gaped and exuded greenish yellow pus. The left lung was involved to a slight extent.

Smears from the right lung and liver showed branching filamentous fungi, (no clubs) characteristic of actinomycosis.

COMMENT

This case was thought to be of sufficient interest to report because of the comparative rarity of actinomycosis in childhood. It illustrates what is generally known as the abdominal type of infection, which has spread either by continuity, or by the portal circulation from the intestinal tract to the liver and thence through the diaphragm to invade the thorax. It illustrates, moreover, the slowly progressive course to a fatal end, with only a slight toxic reaction on the part of the patient, which is characteristic of actinomycosis.

AN EARLY CASE OF CONGENITAL PYLORIC STENOSIS

By L. P. MACHAFFIE, M.D.

Ottawa

This case, I think, is of particular interest for three reasons, namely, the early onset of symptoms (congenital), the nature of the symptoms and the successful performance of the radical operation, 34 hours after birth, followed by a complete recovery.

A careful search of the literature on this subject does not reveal the symptoms occurring immediately following birth nor does it reveal a case with a similar symptomatology. Successful operation at this early age, I think, also is unusual.

Cautley and Dent¹ both recognized the condition in a seven month fetus and cases have been reported which showed symptoms during the early days of life. Out of 38 cases reported by Still, only one case began to vomit during the first 24 hours.

This patient was a full term, female baby, normal delivery; birth weight eight pounds. Father and mother well, two well children, one child gained poorly during infancy, but did not vomit or have enterospasm.

Baby appeared normal at birth, cried lustily and had a ruddy colour. Fifteen or twenty minutes after birth, the nurse in charge noticed that baby was having alarming blue turns. I was summoned to see the case by Dr. Featherston, one hour later. While closely observing baby in one of these blue turns, we noticed that gagging preceded the cyanosis. Baby would make attempts at swallowing, then gag, and bring up a clear, frothy fluid into the mouth. The face and then the whole body would become cyanotic, and baby would make attempts to spit out the fluid, puckering up its mouth; this was followed by a trickling out at the corner of the mouth; the colour would gradually improve and for a few minutes, 5 to 10, baby would appear quite normal, then a repetition of the process would occur; swallowing, gagging, cyanosis, spitting, etc. There was no loss of consciousness, no twitching nor convulsions, crying was lusty, fontanelle not bulging and careful examination of the heart, lungs and nervous system, etc., revealed nothing abnormal. The

frothy fluid was removed by finger as rapidly as it seemed to accumulate, and a catheter was passed quite readily into the stomach. Baby also had frequent bowel movements; very often with the gagging, there would be a passage of meconium at the same time.

An attempt was made to wash out the stomach with sterile water, but before half the amount had passed in, it was ejected with gagging, and cyanosis. Baby was offered 5 per cent lactose solution in half-ounce quantities every two hours. This was for most times taken quite eagerly, but rarely kept down as long as half an hour; sometimes it was brought up immediately. On one occasion the ejection was definitely projectile in character. The baby was offered the breast but refused to nurse.

Baby was admitted to the Ottawa Civic Hospital, and about one ounce of barium given by gavage. By the fluoroscope the stomach could be clearly outlined; the barium could be seen to flow in without any difficulty and quickly filled the stomach. The stomach appeared about the size and shape of a small lemon. The pyloric end had the appearance of the nipple-like projection at the stem end of a lemon. No passage of barium through the pylorus could be detected. Baby seemed quite uncomfortable after 3 or 4 drachms had passed into the stomach and it squirmed and wriggled under the screen and apparently was very distressed. Suddenly, in three or four minutes time all of the barium was ejected in a forcible, projectile fashion. The gagging and cyanotic turns disappeared and projectile vomiting definitely established itself. Visible peristalsis was not detected although not closely watched for. A tumour could not be felt, and the rather frequent bowel movements still persisted. It was considered that we were unquestionably dealing with a definite but early case of congenital pyloric stenosis with complete obstruction, and that rather than delay another 24 or 36 hours, in order to ascertain whether any great benefit could be derived from the use of atropine—a result which seemed unlikely—a surgeon should be consulted immediately. Dr. H. B. Moffatt saw the case with a view to immediate operation. The baby appeared to be in splendid condition; its colour was very good, and it was deemed a good operative risk, and no pre-operative preparation such as transfusion or hyperdermoclysis was thought necessary.

The condition found at operation was quite typical, and was described by Dr. Moffatt as a firm, gristle-like ring, the size and shape of a shelled peanut, encircling the whole of the pyloric ring. Attempts to force the gas from the stomach into the duodenum were unsuccessful. A Rammstedt operation was performed, and the baby came out of the anæsthetic in excellent condition and with a splendid colour. Following operation she made a good recovery but for several days non-projectile vomiting would occur at intervals; in 36 hours curds began to appear in the stool. The stools continued to be frequent, until about the sixth day following operation.

Diluted breast milk in gradually increasing amounts and strengths, was fed in the first two weeks. The mother's supply gave out, but other breast milk was available for a few weeks. Later on, baby progressed satisfactorily on butter flour mixture. At four months of age the weight was twelve pounds; at six months sixteen pounds and at nine months eighteen pounds. Even with this progress there was considerable vomiting and spitting for the first three or four months on certain occasions, and became particularly aggravated if cod liver oil or orange juice were offered even in tiny quantities. The vomiting was always of a transient nature and usually responded to dilut-

ing down the food temporarily; occasionally it was semi-projectile in nature.

The case, I think, is proof that pyloric stenosis is, or can be congenital and may be complete at birth, and also that it does certainly not always occur as the result of spasm after birth; it is inconceivable to think that spasm could arise at birth, and complete pyloric stenosis develop in 34 hours. The cyanosis might prove very baffling, unless the sequence of symptoms were observed very closely. The irritable condition of the intestines with hyperstalsis is interesting and one wonders if activity of the stomach muscle during the intra-uterine life might have caused spasm to be followed later by stenosis. Could the swallowing reflex be present before birth, and the swallowing of liquor amnii with a resulting hyper-peristalsis of the stomach as suggested by Thompson be a cause of the condition? What was the nature of the frothy fluid ejected by the baby immediately after birth? Could such large amounts of gastric juice be present at such an early age? Could a hypersecretion of epinephrin (Pirie²), or pituitrin during the latter weeks of intra-uterine life be a causative agent? These thoughts while purely conjectural are, I think, worthy of consideration.

REFERENCES

1. CAUTLEY, E., AND DENT, Transact. Royal. Med. and Chir. Soc., *Lancet*, Dec., 1902.
2. PIRIE, G. R., *Lancet*, Sept. 20, 1919.

Diet in Treatment of Cardiac Failure.—

Clinical and experimental observations seem to indicate that milk and carbohydrates, particularly those forms of the latter which are easily assimilated, should constitute the major portion of the diet in cardiac failure. A diet has been used by Fred M. Smith, R. B. Gibson and Nelda G. Ross, Iowa City, which has an energy value of 2,100 calories and consists of 44 gm. of protein, 110 gm. of fat and 222 gm. of carbohydrate. It is served in the form of milk, cream, butter, eggs, vegetable purées, cooked cereals and fruit juices. When edema is present, the liquid intake is limited to 1,500 c.c., and the salt is reduced to a minimum. Usually on the third or fourth day other foods, as jelly, crackers (salt free), toast and stick candy, are added. Later, about the eighth day, depending on the condition of the patient, puréed fruits and additional puréed vegetables are incorporated in the diet. Gradually, the consistency of the food is changed from that of the soft to the light diet. In some instances, following the elimination of the excess fluids, particularly in those patients who are greatly undernourished, the energy value of the

diet is increased to approximately 3,000 calories. However, when the patient is obese, the diet is sufficiently reduced to permit a gradual loss in weight. All patients with cardiac failure, with individual exceptions, were treated in the same way. They were put to bed at absolute rest. The routine hospital soft diet was served. The liquid intake was limited to 1,500 c.c., and the urinary output was recorded. The patient was weighed daily when the condition permitted. If after a period of from five to seven days there was no demonstrable change in the general condition and the weight remained stationary, the cardiac diet was prescribed. The favourable influence of the diet is illustrated by five cases reported. The results emphasize the importance of diet in the treatment of cardiac failure. They demonstrate that a change in this feature of the treatment alone may be sufficient to promote the elimination of the excess fluid after the usual remedies have failed. The effectiveness of the diet is believed to be due to the energy value and the form in which the food is given.—*Jour. Am. Med. Ass.*, June 18, 1927.

Editorial

HIGHER QUALIFICATIONS FOR CANADIAN PRACTITIONERS

AS a country develops in population and importance specialism becomes essential to its economy. This applies not only to industry, but to all fields of activity including the practise of medicine. The problem then arises as to the method of indicating qualification in special branches and still more important—what qualifications shall be demanded and to what standard shall they attain.

The countries of older civilization have solved these problems in a more or less satisfactory way, but in the newer countries, and specifically in Canada, the problem still confronts us.

For some years the Canadian Medical Association has appointed successive committees to study this question as applying to the Canadian profession. These committees have had the advantage of the example of the Royal Colleges of Great Britain and of similar bodies elsewhere, and at the last annual meeting in Toronto the Council adopted a report looking toward the formation of the Royal College or Colleges of Physicians and Surgeons of Canada. The details of development have been entrusted to a small group of men all of whom are eligible as charter members. When their work is completed a full report will appear in the pages of the *Journal*.

So far, so good. But two years ago, at the Regina meeting, a committee was empowered to treat with the Royal College of Surgeons of England looking toward an arrangement whereby the attaining of the Fellowship of that College, the "blue ribbon of surgery" would be facilitated for Canadian graduates.

The representations made by that committee were to the effect that the expenditure of time and money required by the journey to London for the primary examination and later for the final prevented many of our graduates from presenting themselves.

The suggestions offered have been carefully and exhaustively studied by a special

committee of the Council of the Royal College, and it is with great pleasure and gratification that we are enabled to make this announcement:—

At a regular meeting of Council of the Royal College of Surgeons of England held May 12, 1927, the President, Sir Berkeley Moynihan, Bt., in the chair, the following recommendation of the Nomination Committee was adopted:—"That it is desirable to send examiners to the Dominions to conduct a Primary Examination for the Fellowship, of the same standard as the examination in this country, on conditions to be hereafter determined, provided that satisfactory arrangements can be made."

Mr. S. Forrest Cowell, Secretary to the College, and Mr. F. G. Hallett, Director of Examinations of the Conjoint Board, were instructed, in consultation with the President, to enter into negotiation with the proper authority in Canada to determine the conditions under which arrangements for the examinations could be made. It was suggested that the first examination could be held in Canada in the summer of 1928.

In all likelihood this Primary examination in Anatomy and Physiology will be open to undergraduates who have completed advanced courses in these subjects, as well as to qualified graduates.

This consideration and concession on the part of such an honourable body must meet with enthusiastic reception by the members of the profession in Canada and especially does this apply to recent graduates qualifying for a career in surgery.

This is but one of the first fruits of the affiliation between the British Medical Association and our own Association and is another bond between Canadian and British medicine. The Committee of our Association, with Dr. Alexander Primrose as Chairman, is to be congratulated upon the happy development of its labours.

But more still remains to be accomplished. The Royal College has so far done its share. Our Association and especially our medical schools must provide the candidates.

The Association can, through these columns and otherwise, reiterate the announce-

ment of the privileges which are offered; the medical schools must see to it that prospective candidates receive such instruction as will enable them to pass with credit.

The Final examination will continue to be held in London. A. T. B.

THE CANADIAN RADIOLOGICAL SOCIETY

THE decision of the Radiological Society to merge its existence as a special society in that of the Canadian Medical Association will, we are sure, give general satisfaction to the members of the Canadian profession, and we look forward to the future development of this Section of our Association as a valuable addition to the interest of our annual meetings. The four classical methods of student days: inspection, palpation, percussion and auscultation must to-day have a fifth added, namely, the employment and interpretation of the x-ray pictures. While radioscopy should in many cases be the last resort in forming our diagnosis, in others, it should be the first. Doubtless, in the diagnosis of many forms of internal disease the other methods should be employed before having recourse to the use of x-rays; but for the diagnosis of many others, the information it gives is most valuable and in the diagnosis of a case of fracture, it must be regarded as almost inhuman to attempt the old method of eliciting crepitus, when it is possible to have a radiogram.

We look forward to the transactions of this Section becoming the authority in Canada on radiography, and feel sure that radiologists will endeavour to maintain all their work at a high and strictly ethical standard. Already, unfortunately, there is evidence of the necessity of some regulation by law of those permitted to use x-rays, which in ignorant hands may be

definitely dangerous. For some time past numerous unqualified persons have been making use of x-rays for medical purposes, and such may become a real menace in our midst. Still more pregnant with danger is the establishment by commercial firms of so-called "beauty parlours" for the removal of hair by means of x-rays from face and arms and places where hair is not wanted; a method of treatment in which severe burns may be produced. The evil results, unfortunately, are slow in developing. It is quite possible that many of those who have been treated in this way may suffer in time from telangiectasis, a deformity which cosmetics can not hide and no known treatment can remove.

This method for the permanent removal of hair on a woman's face, was employed some decades since, but was given up ten years ago by those who had experience of the unfortunate results which may follow. When high voltage for x-rays was introduced some four years ago it was hoped that with this increased strength success might be more assured. Unfortunately, although successful at first this new type of machine would appear to be more dangerous, and the law courts may yet be kept busy as the evil effects begin to become evident. Legislation to limit the use of this method of treatment to qualified persons is now called for, and should be one of the early duties of this new Section of the Canadian Medical Association. A. H. P.

THE ART EXHIBIT AT THE ANNUAL MEETING, TORONTO

AN innovation was attempted during the recent joint meeting of the Canadian and the Ontario Medical Associations in Toronto, and judging from the interests

aroused by it, the Committee feels that the effort was more than justified. The innovation took the form of an "Art Exhibit" of original paintings, etchings and sculpture

by members of the medical profession. The collection which had been brought together at comparatively short notice was placed on view in the Sketch Club Gallery of Hart House and was not only extremely interesting but reflected much credit on those contributing, the majority of whom were more or less self-taught. Among those exhibiting were: Professor J. J. R. Macleod, Dr. F. G. Banting, Dr. R. J. Spence, Prof. J. M. D. Olmsted, Prof. E. M. Walker, all of Toronto, and Dr. A. H. Pirie of Montreal. A more detailed description by a visitor will be found on another page of this issue.

The majority of the contributions were oil paintings, but there were a few water colours and some specimens of modelling. A more representative contribution from the other provinces was desired, but, in the short time available, there were no means of ascertaining who were our amateur artists in other cities, and it was felt that such a start as this would be the best way of arousing interest for future exhibits. Most of the pictures submitted were of a high order and would attract favourable attention in any picture exhibit.

Hobbies have in the past kept fresh the spirit of many in our profession, for Cardan has well said that "in the mind, as in the body, there is the necessity of getting rid of waste." Lister was very fond of fishing and with him "skating became almost a scientific pursuit." It is said that Osler considered his election to the presidency of the British Classical Association to be the greatest honour of his career. Dieulafoy had a wide reputation as an elocutionist. Jenner played both the violin and the flute. Auenbrugger, who instituted thoracic percussion, wrote the libretto for Salieri's "Chimney-Sweep." Gerster was an etcher of note and also arranged for the use of the pipe organ at All Souls' Church in New York for two afternoons a week, so that he could express his emotions "without fear of torturing involuntary listeners." Brahms and Billroth, linked by their common passion for music, practised and appeared to-

gether for years. Alas, Billroth's beautiful music room is now a drab fluoroscopic laboratory which seldom sees the light of day from the quaint little garden beyond! The late C. K. Clark was an excellent violinist and a recognized authority on ornithology. Many others were painters. Pasteur did excellent work in pastel and Charcot was an artist of unusual ability. The virile modelling of Prof. Tait McKenzie is well known to of us.

It has been felt that our Association might very properly encourage the development of certain cultural hobbies among our members. Such achievements as these might be duplicated easily to-day if our members were given a little encouragement, or perhaps one might better say, stimulus, for men of artistic temperament are inclined to belittle their accomplishments. Undoubtedly, many men have latent talents that have never been given a chance to develop. Were an exhibit of creative hobbies to be held every few years in connection with our annual conventions, there is no doubt that many in our profession would submit entries and would take pride in improving their work with each exhibition. The names of several amateur artists in our ranks were given to the Committee during the week, and it is hoped that the works of these doctors and of many others may be available for the next exhibit.

Many helpful suggestions were offered by visitors who wished to see the idea succeed. One very valuable suggestion was that the exhibit be enlarged to include amateur photography, wood carving, music, published volumes on non-medical subjects, biological collections, etc. Prizes might be offered, as is done at present in the golf tournament. There is no doubt but that such an innovation would meet with a wide response and would serve as a link, and a strong one, too, to bind the medical profession together. It would help to solve the problem of how "with labours assiduous due pleasure to mix."

HARVEY AGNEW

THE IMPORTANCE OF PASTEURIZATION FOR THE SAFEGUARDING
OF OUR MILK SUPPLY

A PARTICULARLY valuable paper on the Importance of the Safeguarding of milk as a food, from the pen of Dr. J. W. S. McCullough, Chief Officer of Health of Ontario, appears in the *Canadian Public Health Journal* for the month of June. While milk must be regarded as the best, the cheapest, and one of the most universally employed foods, it is to be remembered that milk is almost the only animal food used in the raw state. Because of this fact, milk has been responsible for more sickness, than all other foods taken together. Many notable milk-born epidemics have developed in Canada during recent years. It has undoubtedly been the cause of several small epidemics of typhoid fever during the past few years. The last, which developed in Montreal this past spring, numbered over 4,000 victims with a mortality of more than 300, appears to have been entirely due to an unprotected milk supply. Epidemics of small proportions have also occurred in Ontario, in Manitoba and in Saskatchewan. In some respects even more important than the above, is the fact that almost all unpasteurized milk carries the bacilli of tuberculosis, both of the bovine and of the human type. Still further, numerous outbreaks of scarlet fever, diphtheria and septic sore throat, have been traced to a milk supply, and raw milk is undoubtedly a most important factor in the causation of summer diarrhoea in children. It is, therefore, of the greatest importance that the public supply of milk should be free from pathogenic microorganisms, and thus infection from this source be prevented.

Many authorities advocate that all cattle should be tuberculin tested, and those found to be tuberculous, should be destroyed. Such a procedure if carried out throughout the Dominion, would cause a milk famine, because from 35 per cent to 50 per cent of our cattle, have tuberculosis. The financial loss arising from the elimination of these tuberculous cows, would make such elimination impracticable, even if the Government were in a position to provide the personnel

to make the tests. Still further, after all cows suffering from tuberculosis had been destroyed we would still have to face the danger of infection of the milk taking place from human tubercle bacilli, as well as from other disease producing germs to which we have already drawn attention.

Attempts have been made to secure an absolutely pure milk—the so-called “Certified Milk” that would solve the difficulty for those who could afford the expense, but after twenty years’ experience in New York City, certified milk constitutes but three-quarters of one per cent of the entire milk consumption in that city. In Toronto also, after seventeen years during which certified milk has been provided for those who chose to pay for it, the consumption of this article has been confined to the very few, and the amount has formed only one-half of one per cent of the total supply. Dr. McCullough also draws attention to the fact that even certified milk is not always absolutely safe. Cases have arisen in which this special milk has been infected from carriers; tuberculosis also has developed in even certified herds, so that in the course of a year infected cows have been found in from 5 to 25 per cent of the herds of these supposed to be all healthy animals. In 1914, in one of the most celebrated certified herds of the United States, it was found that 191 tuberculous cows were met with in a herd of 632 supposed to be perfectly healthy animals. Unquestionably, the best and only real safeguard for milk is effective pasteurization at a temperature from 142° to 145° at which it must be held for 30 minutes and must then be promptly cooled to 40° F.

Many objections have been raised against this pasteurization of milk. It is claimed that the vitamins in the milk are destroyed as well as the lactic acid bacilli, so that such milk does not sour, but putrefies. It is also stated that the use of pasteurization has a tendency to promote relaxation of the other safeguards necessary for the procuring of clean milk, and that the equipment demanded for pasteurization will tend to place

a monopoly of the milk in the hands of a few persons or companies which will promptly result in higher prices. The price at which milk is sold may, however, in great measure be controlled by a municipality. The loss of vitamins in pasteurized milk is easily made good by the use of fruit juices—an article of diet which should always be included in the food of young children. The danger against using unclean milk for pasteurization must and can be prevented by demanding that before pasteurization no milk obtained in the country shall contain more than 300,000 bacteria, and no more than a million and a half per cubic centimetre when brought to the city. In the libel suit brought by a milk company against the *Montreal Star*, Dr. North an expert sanitarian, who for the past ten years has been devoting his attention to the purification of the milk supply in the larger cities

of the States, stated that he considered it would be a calamitous disaster if the practice of pasteurization at this age of the world was omitted or checked. Throughout all the large cities in America numerous infectious diseases would break out owing to the employment of raw milk. Speaking as a member of the American Health Association, he also stated that there was not a dissenting voice among the public health officers of American cities on the absolute necessity of pasteurization as a public health measure. Dr. Harris, Medical Officer of the City of New York, who also gave testimony at the same investigation, when asked whether he favoured pasteurized milk in comparison with raw milk as a food, stated: "I do not merely favour it, I regard it as an indispensable measure for the protection of the public health."

ETIOLOGY OF MEASLES

IN the *American Journal of Public Health* for June, N. S. Ferry follows up previous papers relative to the isolation of a *Streptococcus viridans*, which he considers to be the causative agent of true measles, and to which he has given the name *Streptococcus morbilli*. Ferry describes this as a medium sized, Gram positive, aerobic streptococcus, developing long chains in a liquid medium and chains of varying length on a solid medium, and which produces a small colony with a green halo on whole blood sugar. It does not dissolve red cells nor liquefy gelatin, nor is it soluble in bile. It ferments glucose, lactose and saccharose, but not mannite, salicin or inulin. It produces an extracellular toxin specific to measles. For this organism Ferry claims that live and dead agar suspensions and the filtrate of broth cultures will, when injected subcutaneously or intracutaneously into rabbits, produce typical local reactions, which are frequently followed by generalized rashes and congestion of the conjunctiva. These reactions may be prevented by the previous injection of measles convalescent serum or measles

antitoxin. The antitoxin may be produced by hyperimmunizing rabbits and horses with the toxin of the *S. morbilli*. Concentrated antitoxic serum has about three times the strength of measles convalescent serum. The antitoxin, like convalescent serum, will neutralize measles toxin in vitro as well as in vivo. Except it is in very low dilution, heterologous seras (scarlet fever, erysipelas, puerperal septicæmia) will not neutralize the measles toxin. Other evidences of the specificity of measles toxin are presented. The antitoxin has been used successfully as a prophylactic in a limited number of exposed persons, and, when injected early enough in the course of the disease, has prevented the appearance of the rash. Several public health officials are now investigating the clinical usefulness of the antitoxin. Ferry further claims that persons with no history of measles and patients in the pre-eruptive and early stages of measles give positive skin reactions after intracutaneous injections of measles toxin, while those with a positive history of the disease give negative reactions.

W. H. HATTIE

THE PRESENT STATUS OF VACCINATION AGAINST TUBERCULOSIS

THE whole of the March number of *Annales de l'Institut Pasteur* is devoted to some phase of the problem of vaccination against tuberculosis with the avirulent bovine strain developed by Calmette and Guérin and designated "B.C.G." (Bacilli Calmette-Guérin). In its entirety the problem falls into two divisions: (1) evidences of the protective value of vaccination with this organism, and (2) evidences of its innocuousness.

I.—*Evidence of the Protective Value of Vaccination with B.C.G. Against Virulent Reinfection.*—Infants are given three doses of the living organism during the first ten days of life when it is known that the intestinal canal is more permeable. Very few develop skin hypersensitiveness. Over 20,000 infants have now been vaccinated in France with a mortality from tuberculosis of 1-3 per cent while statistical studies show that in a similar non-vaccinated group the mortality is about 26 per cent. It is on this statistical basis alone that one can at present base any conclusions on the protective value of "B.C.G." in man and this is open to criticism. Couvelaire, for instance, has recently reported a decrease in the death rate of infants born of tuberculous mothers from 33 per cent to 7.2 per cent owing to strict isolation. In an editorial which appeared in the *British Medical Journal* (May 7th) an analytical review of Calmette's figures is given. Two French statisticians, using a group of vaccinated children living in contaminated surroundings showed that the mortality from all causes during the first and first two years of life was 7.29 per cent and 8.9 per cent respectively, while for the same group Calmette claims that 25 per cent die of tuberculosis in the first year, so that the general mortality rate would be still higher, a marked discrepancy from the figures just quoted. That the problem of comparing statistical groups is very complicated may be indicated from the following case: the two first children in a family developed tuberculosis, at which time the source of infection was traced for the first time to the father. The third and fourth children are free, one having been vacci-

nated and one not. In other words, the knowledge of existing tuberculosis and the consequent precautions taken may alone play an important part in preventing infection, and the only way to arrive at a definite conclusion of the effect of vaccination is to keep controls as well as vaccinated infants in such families.

In the case of animals Guérin has reported striking results from vaccinating calves in a tuberculous herd intravenously or subcutaneously after all sanitary precautions had been lifted. For the smaller laboratory animals Tzekhnovitzer on behalf of the Ukrainian Commission has reported less striking results, with which Selter's findings concur. These authors find that vaccinated guinea pigs manifest some degree of protection to virulent reinfection but that this is not very striking.

II.—*Evidence of the Innocuousness of "B.C.G."*—This type of vaccination has now been employed not only in France but in Belgium, Greece, Italy, Roumania and Ukraina, as well as in French Indo-China and Algeria. To date in several tens of thousands of vaccinations no accident has been reported. Couland has given rabbits intravenously large doses and finds that the lesions which are produced in the lung, liver and spleen are completely resolved in about six months. Similar findings in guinea pigs have been reported by Kraus and Selter in Germany who conclude that the vaccine is slightly virulent. In only occasional cases has a generalized tuberculosis been reported in guinea pigs and these were explained as being probably an accidental spontaneous type of tuberculosis. No one has reported producing disease in series.

At many centres in America work is now being done with "B.C.G." both as regards its innocuousness and its protective value, and it is surely not too much to ask that the results of these investigations be awaited for a year or two longer. In the meantime, if the community desires to initiate at once a campaign for vaccination of children of tuberculous parents they can resort to the use of dead tubercle bacilli which are now being used to a limited degree in Germany

and England. In America this type of protective vaccination has not been used but some chronic cases of tuberculosis are being treated with heat-killed tubercle bacilli.

ARNOLD BRANCH

BIBLIOGRAPHY

CALMETTE, A., GUÉRIN, C., NEGRÉ, L., BOQUET, A.,
MALVOZ AND VAN BENEDIN, J., CANTACUZENE, J.,

BLANG, G., ROUGEPIEF, A., BERNARD, N., REMLINGER
AND BAILEY, COULAND, E., ASCOLL, A., GENTILL, E.,
GEROSA, G., MANGIAROTTI, A., NAI, A., SETTI, C.,
ZOTINI, F. O., BOSSI, A., TZEKHOVITZER, M., *Annales de l'Inst. Pasteur*, 1927, xli, 15-368.

COUVELAIRE, A., *Presse Med.*, 1927, xxxv, 225.

KRAUS, R., *Wiener klin. Wchnschr.*, 1927, xl, 49.

SELTZER, H., AND BLUMENBERG, W., *Klin. Wchnschr.*,
1927, No. 24, 1134.

Editorial, *Brit. M. J.*, May 7, 1927, p. 845.

REPORT ON WINDOW GLASS SUBSTITUTES

THE Council of Physical Therapy of the American Medical Association has recently carried out an investigation to determine the efficiency of certain window-glass substitutes for transmitting the anti-rachitic rays of sunlight. The following is an abstract of the report.* The materials submitted to their tests were:—

Vitaglass, of which there are two kinds: one form smooth and transparent, the other rough and translucent, (Vitaglass Corporation, New York.)

Corning glass (Corning Glass Works, Corning, N.Y.)

Celo-O-Glass, composed of wireless screen filled with an apparently celluloidinous material, (Acetol Products Co., New York.)

Flex-O-Glass, a thin, fairly-loosely woven cloth, treated with a paraffin-like substance, (Flex-O-Glass Manufacturing Company, Chicago.)

Tests were made to determine the passage of ultra-violet rays, and how each substance withstood weathering. As a result of these investigations, it is believed that there are now available materials for the glazing of windows which do not possess the fault of window-glass in excluding the health-giving rays of sunlight. Corning-glass and the clear vita-glass are stated to be true glass and are as transparent to vision as is window-glass. The rough form is particularly suitable where privacy is desired.

Celo-O-Glass and Flex-O-Glass are not transparent, but the data presented show their comparative value for use in solariums and for animal husbandry in cases in which

transparency is not essential. Both of these substances are less expensive than ordinary window-glass, the Flex-O-Glass does not withstand the onslaught of the weather as well as does Celo-O-Glass. The waxy coating of the Flex-O-Glass has a tendency to soften in hot sunshine, and dust may then adhere, which is not easily washed off. This material, however, is primarily intended for use in animal husbandry to provide protection in winter. During the hot summer months, it may be removed.

Biological tests on chickens indicate that Vitaglass and Celo-O-Glass transmit a large percentage of the sun's ultra-violet rays. Chickens reared behind these, showed similar development to those which received radiation directly from an artificial source. Chickens which received sunlight through Flexo-O-Glass did not gain quite as well as the irradiated controls, but more rapidly than those receiving sunlight through window-glass. There was no appreciable difference between the growth and development of chickens receiving direct sunlight through window-glass and the growth of those receiving only the diffused light in the interior of the laboratory.

In Canada a clear vision window glass (vioray glass) carefully tested in Oshawa to determine its power of transmitting ultra violet light is now procurable and would appear to transmit ultra violet rays in greatest possible intensity.

* *J. Am. M. Ass.*, May 14, 1927.

Editorial Comments

THE DIABETES DEATH RATE

A statistical analysis of deaths from diabetes among industrial policy holders of the Metropolitan Life Insurance Company (reported in that company's statistical bulletin for May) is confirmatory of the general experience that, despite the introduction of insulin, the death rate from this disease continues to increase in the higher age groups. The study covers the period 1911-1926. White and coloured persons are considered separately, and by sexes. The advent of insulin has seemingly not influenced the diabetes death rate in coloured persons of either sex, perhaps because they have not received insulin treatment to the same relative extent as white persons. It is particularly in those who have passed the age of 45 that deaths from diabetes show a tendency to increase, and this tendency is much more apparent in females than in males, and more apparent in coloured females than in white females. In white persons under 45 years of age, there has been a slight decline in the death rate, but in coloured persons the reverse holds true. During the war period, the diabetes death rate of females declined appreciably, but has been rising again since 1920. The inference is that restriction of sweets during the war, followed by increased consumption, may have had a part in affecting the rate. Whatever the reason may be, the number of diabetics appears to be constantly growing larger, and doubtless the death rate would be higher than it is, were it not for the use of insulin. W. H. H.

ON MOUNTAIN SICKNESS

Much has been written and careful studies have been made on mountain sickness,* and many theories have been advanced regarding its cause. A few facts stand out clearly. Mountain sickness presents itself only in a small number of individuals, and among these are some who are only attacked once or twice and never again. Sufficient stress has not been laid on the fact that digestive troubles which are easily avoided not infrequently assume the appearance of this malady. A pre-eminent symptom, however, of this disease is an insurmountable fatigue, out of all proportion to the muscular exertion that preceded it. Headache, vomiting and somnolence are only secondary manifestations. Mountain sickness may set in at a height of 2,000 metres, more frequently not until 3,000

metres, that is at an altitude at which the proportion of oxygen in the air is only slightly diminished. For this reason and others the explanation of mountain sickness by anoxæmia appears inadequate.

In evaluating certain cases of death during the course of an ascent, of which the cause could not be traced to any organic malady, and considering that fatigue and faintness is the primordial fact in this condition, a recent writer suggests that a defective functioning of the suprarenal capsules may be an important cause of the trouble.

We know that in a rat from which these organs have been removed, the execution of a series of movements by the animal is followed much more quickly by fatigue than in the normal animal. Again, when these organs are diseased in man, he is overcome by extreme fatigue on relatively very slight exertion. We may therefore suppose that, in certain individuals, the functions of the suprarenal glands are diminished, either constitutionally or as a result of disease, and above all of infections. For the suprarenal gland has as its function the support of the circulatory tonus, and besides this it is considered to destroy the toxic substances formed in muscular work.

Such are the chief considerations that have led the writer to suggest this hypothesis and to propose the use of suprarenal substances in such conditions.

It is further to be noted that, according to the theory of Loewy, Director of the Research Institute at Davos (Switzerland), the circulation and consequently the transportation of oxygen, is not the same in all individuals, and that certain parts of the organism, such as the respiratory system, are sensitive to a diminution in the amount of oxygen content, which does not produce the slightest effect on other organs. Bayeux in his researches on rabbits on Mont Blanc has proved that the walls of the alveoli of the lungs become swollen, whence results a diminution of their cavity and of the calibre of the vessels, which leads to difficulty in the pulmonary circulation, and to lessened oxygenation.

The following conclusions are drawn. The etiology of mountain sickness is complex. Two elements predominate in it: (a) a deficiency in the activity of the suprarenal glands, and (b) the sensitiveness of certain organs to a reduction of oxygen in the blood stream and hence defective function. The treatment of mountain sickness consists in the use of preparations of suprarenal gland and of oxygen under pressure.

* Encore le mal de Montagne (Mountain Sickness Again), E. Thomas, *Les Alpes*, 1926, ii (7), 275-379.

FAT EMBOLISM

The importance of fat embolism acquires added emphasis through the larger number of organs that have come to be recognized as possible of involvement. Previous belief has assigned its occurrence to the liberation of fat particles into the blood stream from the mechanical disturbance of fat depots, notably in the bone marrow. Lehman and Moore* of the Department of Surgery at the Washington University School of Medicine in St. Louis have recently challenged this exclusive view and direct attention to the possibility that normal blood fat may become a source of fat embolism. These investigators maintain that the blood fat, highly dispersed as it is, can be made to

become embolic under certain circumstances. Administration of ether is the most conspicuous of these thus far demonstrated, and they refer to the possibility that after prolonged anaesthesia death may be due to fat embolism. That more deaths have not been occasioned in this way they attribute to the general practice of starvation before ether anaesthesia.

The state of aggregation of fats in the blood is subject also to modification by various chemical agents, and Lehman and Moore refer to the literature of fat embolism in poisonings as suggestive that the physical state of the blood fat should receive consideration in every instance in which medicaments are introduced into the blood stream. This has an obvious bearing on the problems of intravenous medication and emphasizes heretofore unrealized but potential dangers.

* E. P. Lehman and R. A. Moore, Fat Embolism. Experimental Production without Trauma, *Arch Surg.*, March, 1927, xiv, 621.

Men and Books

THE ART EXHIBITION AT THE
TORONTO MEETING

A new feature adding greatly to the interest of our annual meeting was the exhibition of paintings held in the Sketch Club Gallery of Hart House, Toronto. This collection of paintings, for the organization of which the Association is indebted to Dr. Harvey Agnew of Toronto and for the tact and energy shown in selecting and arranging the display, must be regarded as in every way creditable to the profession. Our only regret was that so few exhibits were contributed by members of the profession in other provinces. Entering the gallery our attention was at once attracted by a charming head of a lady by Prof. A. H. Pirie of the Radiological department of the Royal Victoria Hospital, Montreal, painted with the close attention to detail considered so essential by the Scotch School in the later decades of the last century. Several landscapes in water colour by Prof. J. J. R. Macleod, manifest the lover of nature. A pleasing effect of sunlight following storm over a Scotch landscape is charmingly presented, and the picture of a sandbar near Nanaimo, B.C., showed excellent colour blending. Dr. F. G. Banting exhibited several small oil paintings. He paints rapidly, in a broad virile style much in keeping with the rugged forceful nature of our own Canadian country, and manifests a keen sense of mass contrasts and of colour value. His painting of the village of Bic on the Lower St. Lawrence presents a bright winter scene in French Canada, in which the colour effects are

developed with taste. Another of his canvasses presents a combination of rocky coast line with seascape and sunset near Skagway; others present scenes in Jasper Park with Pyramid and Atlin Mountains as their prominent feature. An interesting piece of work was a sketch of his laboratory—the "Lab" as it was termed by him with its sterilizers, its rows of jars, bottles and test tubes, and its wooden bench and stool.

Dr. Harvey Agnew, the organizer of the exhibition, had several very charming pictures that display power and a keen sense of autumnal beauty and colour. "Approaching the Last Portage" is the picture of a cleverly handled sunset in the Algonquin Park seen through a group of autumn trees. Another bright scene was entitled "Autumn Leaves on the Humber." Two pleasing Italian pictures depicting morning sunlight, "Ravello" and "On the Arno", were also contributed by him. Among other attractive contributions were paintings and etchings by Prof. J. M. D. Olmsted, formerly of the Department of Physiology in the University of Toronto, but very recently appointed professor in the University of California. Some good work was shown by Dr. Roy J. Spence, a young artist who chooses his subjects with excellent taste, and develops very pleasing colour effects. His painting of "Spring on the Don" evinces strong handling of brilliant sunlight on bare trunks and April grass. Prof. E. M. Walker, of the Department of Zoology, had the largest individual exhibit. Most of his contributions were of pastoral scenes and north country studies all of which show excellent composition and good cloud effects. Dr. B. L.

Guyatt contributed several very good specimens of head modelling.

Altogether the exhibit was a display of the love of nature and the excellent taste and talent which many of our profession manifest during their spare and holiday hours.

ON EUTHANASIA

Much has been written on this subject not only in days long past, but also in more recent times by men of diverse interests and of all shades of opinion. However ready both priest and physician may have been to agree to the proposition in the abstract, very few either alone or in council have been prepared to accept the responsibility of ending a sufferer's life, either by drugging or in any other quiet and comparatively painless way.

A writer in the *British Medical Journal* April 23rd, again discusses the subject and quotes the following statements in reference to it:—

Sir Thomas More in *Utopia* has revealed his own quite definite view in these words:

"When any [Utopian] is taken with a torturing and lingering pain so that there is no hope of recovery or of ease, the priests and the magistrates come and exhort them that since they are now unable to go on with the business of life and are become a burden to themselves and to all about them, so that they have really outlived themselves, they should no longer nourish such a rooted distemper, but should choose rather to die since they cannot live but in much misery; being assured that if they deliver themselves from their prison and torture, or are willing that others should do it, they shall be happy after their deaths. . . ."

Three hundred years later we find Lionel Tollemache, in his well known essay *The Cure for Incurables*, writing as follows:

"If a summary remedy could be applied to this suffering there would be the further advantage that persons of a morbid and brooding nature might gain confidence through life, and that knowing that death would be deprived of its sting, they would have a sort of negative stimulus or (if I may so say) an anti-preventive to exertion. Then again, we must consider the friends, who, besides the immediate suffering of nursing the sick man, often permanently impair their constitutions and nervous systems, and who moreover are thus exposed to a sort of moral suicide; I mean they curtail their own powers of usefulness far more than a dose of laudanum would curtail those of their dying friend. . . . On the whole it cannot be doubted that the benefits resulting from a change in the law would be simply enormous."

Thus have spoken the statesman and the philosopher of widely different ages. What of the poet? Joseph Severn, the friend of Keats,

who was with him at his lonely death in a foreign land, has left the following passage on record:

"One day he broke down suddenly and demanded that this foreseen resource should be given him. The demand was for the phial of laudanum I had bought at his request at Gravesend. When I demurred he said to me that he claimed it as his own and his right, for, he added, with great emotion, 'As my death is certain, I only wish to save you from the long miseries of attending and beholding it. It may yet be deferred and I can see that you will thereby be stranded through your lack of resources and you will ruin all your prospects. I am keeping you from your painting and as I am sure to die, why not let me die now? I have now determined to take this laudanum and anticipate a lingering death while emancipating you.' As I still refused to let him have the laudanum he became furious . . . and yet in all this there was no fear of death, no want of fortitude or manliness, but only the strong feeling on my account to which he regarded himself and his dying as secondary."

Again, a quotation may be made from the memoirs of a famous musician, Berlioz:

"I have lost my eldest sister; she died of cancer of the breast after six months of horrible suffering which drew heartrending screams from her day and night. My other sister, who went to Grenoble to nurse her, and who did not leave her till the end, all but died from the fatigue and the painful impressions caused by this slow agony. And not a doctor dared to have the humanity to put an end to this martyrdom by making my sister inhale a bottle of chloroform. This is done to save a patient the pain of a surgical operation which lasts a quarter of a minute, and it is not had recourse to in order to deliver one from a torture lasting six months. . . . The most horrible thing in the world for us, living and sentient beings, is inexorable suffering . . . and we must be barbarous or stupid, or both at once, not to use the sure and easy means now at our disposal to bring it to an end. Savages are more intelligent and more humane."

In striking contrast to this we have the exactly contrary opinion of the great Napoleon recorded during a conversation at Elba with Lord Ebrington:

"I have often thought since on this point of morale and have conversed on it with others *et je crois qu'au fond il vaut toujours mieux souffrir qu'un homme finisse sa destinée quelle qu'elle soit*. I judged so afterwards in the case of my friend Duroc, who, when his bowels were falling out before my eyes repeatedly cried to me to have him put out of his misery. *Je lui dis, je vous plains, mon ami, mais il n'y a pas de remède, il faut souffrir jusqu'à la fin.*"

Even at the present day this same question is debated in the public press, and while in many instances to the theorist euthanasia not only commends itself as desirable, but in some cases

even almost as imperative, yet every member of the profession when called upon to put the theory into practice shrinks from the task. Cases however do occur in which after *due consultation* it would appear merciful if our profession under certain recognizable and defined conditions could be authorized to act.

ON THE FIELD OF HONOUR*

There are two accounts of duels in which medical men participated in Canada. One of these affairs was between doctors in Brantford, in 1836; the other saw a doctor and a layman engaged in Perth.

"Brantford, February 27th, 1836.

"Dundas 'Weekly Post.'

"A meeting having taken place this morning between Dr. Dowding and Dr. ———, after an exchange of two shots each between the parties, the seconds interfered, and although a reconciliation was not effected between them, it was agreed that Dr. Dowding should retract the words, 'liar, scoundrel and coward,' applied to Dr. ———, and that the latter should in like manner retract the words, 'liar, villain, scoundrel and fool,' applied to Dr. Dowding, and that all reflections upon the character of either party as a gentleman, now published or in the press, should be considered as retracted.

"(Signed) Lloyd Richerdson,
(In behalf of Dr. Dowding).

E. Saunders,
(In behalf of Dr. ———).

"*Duel.*—On Friday, the 11th inst., Alexander McMillan, Esq., and Alexander Thom, Esq., met in a field, on the Brockville Road, to decide an affair of honour—the former attended by Mr. Radenhurst and the latter by Mr. Cumming. After exchanging shots

the seconds interfered, and, on mutual explanations being made, the matter terminated amicably. Dr. Thom received a contusion on the leg."

Doctor Thom was a staff-surgeon in the War of 1812. He later settled in Perth, Ontario, and died in 1845.

H. C. JAMIESON.

The details of a duel which took place early in the last century and was connected with the granting of a charter to the Montreal General Hospital has been described by Dr. F. J. Shepherd, in his account of the First Medical School in Canada†.

With our modern views on the necessity of hospitals and the advantages which they conferred upon the community, it appears strange that a charter for such a good object should be so strongly opposed as it was, notwithstanding that it was supported by members of the profession both in Montreal and Quebec, and received the eloquent advocacy of the Honourable John Molson. One of the chief opponents was a Mr. O'Sullivan who spoke very strongly against it and against the teaching of medical students. He said that the Hotel Dieu hospital with a slight addition to its buildings would fill all needs of the city, and that as for advancing medical science, they would only experiment on the patients and allow ignorant students to treat them. Protesting such statements Dr. Caldwell wrote a strong letter to the daily press to which he did not sign his name. Mr. O'Sullivan very promptly referred to this letter in the House, and said if the writer of the letter would declare himself he would call him out. Next day Dr. Caldwell wrote under his own name a still stronger letter and was called out by the irate legislator. Five shots were exchanged with pistols which in those days carried ounce bullets. Mr. O'Sullivan was shot through the chest, and Dr. Caldwell had his arm shattered. Both recovered after severe illness. The following year, 1823, the charter was granted, although the central building of the hospital had been in running order since early in the previous year.

*The Medical Profession in Canada, 1783-1850, Wm. Canniff.

†Canad. M. Ass. J. April, 1925, xv.

Studies in Epidemiology of Rheumatic Fever.—David Seegal and Beatrice Carrier Seegal, Boston, endeavoured to determine the annual incidence of rheumatic fever over a significant period of years in a representative group of hospitals in the United States, its possessions, and Canada. A group of ninety-four general hospitals were selected from the American Medical Directory as the source of the data. In choosing the series, hospitals of long standing, with more than 200 beds and with teaching affiliations, were given the preference. Institutions devoted pri-

marily to the treatment of tuberculosis, mental diseases, chronic invalids and the like were excluded. Of ninety-four requests for information, thirty-eight, or 40.5 per cent responded with data which were utilized in the survey. Since the year 1918 the disease has not shown a uniform tendency to decrease in frequency in the hospitals of this series. The figures for the final two years of the study, 1924 and 1925, demonstrate an increased rate of rheumatic fever in some of the hospitals of the series.—*Jour. Am. Med. Ass.*, July 2, 1927.

Correspondence

London Letter*(From our correspondent)*

Diphtheria in London.—It is to say the least disquieting in these days of scientific preventive medicine to find that the number of cases and the death rate of diphtheria are displaying an upward tendency in this country. It is true that the mortality rate still continues a downward path, but even this is slowing up. We are so accustomed to speak of the conquest of diphtheria as a triumph of medicine, but it has recently been shown that London has a higher incidence and mortality rate than any other large city in Great Britain, and higher than almost any other European capital. Yet it would appear that we have the means in our power to remedy this for in New York diphtheria has shown a marked decline in recent years, and in that city the Schick method of testing and immunization has been in vogue since 1916. Dr. J. Graham Forbes has recently contributed a report to the Medical Research Council (Special Report Series No. 115) on the subject of diphtheria and its prevention in which he quotes among other statistics figures supplied by the London Borough of Holborn. In a school where there were 600-700 boys there occurred thirty-two cases of diphtheria in 1922. Testing and immunization were carried out and in the next year only one case occurred, the following year none, and in 1925 two cases in both of which the parents had refused to allow immunization to be carried out. Other institutions can report equally striking figures and certain other boroughs have adopted the Schick methods. But to the surprise of the enlightened members of the profession the London County Council has refused to apply the methods to the children under its care. The estimated cost of protecting these London school children is set at the most at £100,000 while the rate-payers have annually to pay about £500,000 as the cost of diphtheria. It may be that the financial aspect appeals to the Scotch education authorities for they are certainly more advanced than their English colleagues. Of the Scottish people 1 in 175 receives active protection, while in England the figures are 1 in 4,560. With strict standardization of material the Schick test appears to be harmless and it is far too valuable a weapon for London to disregard.

Coroner's Law and Death Certification.—On May 1st the "Coroner's (Amendment) Act, 1926" and on July 1st the new "Births and Deaths Registration Act (1926)" came into operation so that medical practitioners are again occupied in grasping certain legal points in the new measures which necessarily affect them. The former of

the new Acts was a Government Bill and is concerned with rules for regulating the practice and procedure at or in connection with inquests and post-mortem examinations. Certain questions as to fees are dealt with in the Act itself, but the "rules" mentioned above are to depend upon further action by the Lord Chancellor and the Home Secretary. The second Act was a private member's motion chiefly sponsored by Dr. F. E. Freemantle. It will greatly help in promoting accuracy in the returns of the causes of death, and should render the Registrar General's statistics more valuable. The most important changes are concerned with the certification of stillbirths, which are to be registered in the same way as other deaths, and with the sending of the death certificate direct to the registrar instead of handing it to the relatives of the deceased. The Act is also concerned with more closely controlling the disposal of the body so that the community will be more adequately protected from crime which might be concealed by means of certain loopholes in the previous Act of 1874.

Lunacy and the Law.—At the present time in England it is safe to say that many practitioners of medicine would prefer to run a long distance rather than certify a lunatic. It is not quite certain whether it is worse to be certified, or be the doctor who certifies. Even if the medical man exercises the greatest care in what may well be one of the most difficult problems he is ever called upon to solve in his practice he may find himself involved later on in troublesome litigation, when well-known specialists will disagree as to facts and deductions from facts while a jury confronted by what appears to be sanity incarnate in the person of the plaintiff can be relied upon to disregard the medical evidence. This is no exaggeration of what has been happening in the last few years. The well-known "Harnett" case has just been concluded by a decision in the House of Lords on a matter of law concerned with the Statute of Limitations dating from 1623! Mr. Harnett was certified as insane by Dr. Fisher in 1912. He issued a writ in 1922 and was awarded £500 damages, the jury finding that he was not of unsound mind when certified, and that Dr. Fisher had not acted with reasonable skill and care in certifying him. However, in the end Mr. Harnett lost, for the Statute of Limitations enacts that an action of this kind must be begun within six years of the existence of the cause for the action. Another recent action was the case of "de Freville v. Dill" in which a jury gave a verdict of £50 damages against Dr. Dill. There remain certain legal points to be argued in this case, but what was particularly interesting was the sum-

ming-up of Mr. Justice McCardie. He showed himself thoroughly sympathetic with the practitioner's difficulties in lunacy matters. He pointed out that the Lunacy Acts contain no definition whatever of insanity, unsoundness of mind or lunacy. With practically nothing to guide him a country practitioner may be asked to give an urgency certificate after a necessarily

brief examination of a wild patient. The Representative Meeting of the British Medical Association is to discuss the question of the lunacy law and its administration at its Edinburgh Meeting and members of the profession are, to say the least, anxiously watching the course of events

ALAN MONCRIEFF

London, July, 1927.

Reports of Societies

THE MEDICAL SOCIETY OF NOVA SCOTIA

REPORT ON THE CANADIAN MEDICAL ASSOCIATION EXTRA-MURAL LECTURES

A series of addresses under the scheme for extra-mural post graduate instruction, given before several of the branches of the Medical Society of Nova Scotia, was completed on the first of June. The lecturers were Drs. G. Harvey Agnew and R. V. B. Shier, of Toronto. They were accompanied by Dr. Smith L. Walker, Associate Secretary of the Medical Society of Nova Scotia, who spoke at most of the meetings in advocacy of the proper organization of the medical profession, emphasizing ethical conduct and urging support of the national association. The first meeting was held at Amherst on the 23rd. of May, when Dr. Agnew dealt with Some Medical Problems of Pregnancy, and Dr. Shier discussed Pre- and Post-operative Treatment. At New Glasgow, on the 25th of May, Dr. Shier repeated the address given at Amherst and also spoke on Gastric and Duodenal Lesions, while Dr. Agnew gave two papers, one on the Treatment of Nephritis and the other on the Treatment of Pernicious Anæmia. The following day, meetings were held at Halifax, clinics being conducted in the afternoon at the Victoria General Hospital, while in the evening Dr. Shier took Intestinal Obstruction for his subject and Dr. Agnew chose Medical Problems of Pregnancy. On the 27th. of May, the party was at Bridgewater, where, after a morning at the hospital, each of the visitors gave two addresses. Dr. Agnew's papers were the same as those given at New Glasgow; Dr. Shier spoke on Pre- and Post-operative Treatment and Acute Abdominal Emergencies. The same subjects were discussed by Dr. Shier at Windsor, May 30th, at Yarmouth, May 31st., and at Middleton, June 1st. At Windsor, Dr. Agnew dealt with Precordial Pain and the Treatment of Nephritis while at Yarmouth and Middleton his subjects were the Medical Problems of Pregnancy and the Treatment of Nephritis. All the meetings were well attended, and the greatest satisfaction was expressed relative to the address-

es. At Halifax, a delightful informal reception was held after the evening session at the home of Dr. Murphy, the President of the Branch. Banquets were held at Bridgewater and Middleton, while at other places motor drives or other forms of entertainment were arranged.

ASSOCIATION OF AMERICAN PHYSICIANS*

SENSIBILITY TO PAIN OF THE PERICARDIUM; STUDIES IN EXPERIMENTAL THROMBOSIS; MYRTILLIN A DIABETES REMEDY; REACTION OF CHRONIC NEPHROSIS TO THYROID AND PARATHYROID MEDICATION.

At the 42nd annual meeting of the Association of Physicians held at Atlantic City, May 3-4, 1927, among the many interesting papers read was one by Dr. Joseph Capp of Chicago on the Sensibility to Pain of the Pericardium. In this he stated that while there was an impression that pain is the characteristic symptom of pericarditis, Mackenzie was impressed by the absence of pain without traces of pleurisy. When pain exists it may be dull or sharp. In order to investigate the underlying conditions experimental methods were employed. By paracentesis the serous pericardium and sac round the heart were reached through the fourth interspace and no pain was induced. When entry was made through the fifth interspace pain was induced in the phrenic nerve region of the neck. Four clinical groups were studied: (1) pericarditis with effusion; (2) dry terminal; (3) cases with coronary thrombosis, and (4) with pleurisy.

In the first group even with large effusion there was no pain or respiratory distress. In the second type of dry terminal pericarditis there was also no pain. Neither was there any pain with coronary thrombosis, but in pleuro-pericarditis there was sharp pain at the end of inspiration, and also pain in the shoulder. Experimentally, pain was not elicited by irritation of the serous sac or of the sheath of the heart. The only pain elicited was by irritation of the phrenic nerve supply by puncture through the fifth interspace.

* The Lancet, July 2, 1927.

DR. L. G. ROWNTREE contributed a paper entitled

Studies in Experimental Thrombosis.

Six or seven per cent of the surgical deaths in Rochester, he said, are due to pulmonary embolism. We have tried to study this phenomenon by experimental methods, with a view to devising an effective régime for its prevention. We used experimentally a tube with a dialysing membrane, which is put into the vein and the blood flows through without contact with the air. By means of our apparatus we can slow the stream or make it rapid; we can apply heat or cold or chemical substances; we can produce pathological conditions; and we can study extra-corporeally thromboses which occur in vivo. We can study what is going on in the tube. We find heat hastens coagulation time and cold retards it. To prevent clotting we used heparin, which is an anti-prothrombin. Coagulation is much delayed thereby and clots form slowly, but there is no thrombosis. In jaundiced animals there was great formation of white thrombi but no fibrin. With many platelets, and without fibrin formation, the blood continued to circulate. Thus it seems possible to prevent fibrin formation.

DR. F. M. ALLEN (Morristown, N.J.) described *Myrtillin, a Diabetic Remedy Orally Administered.*

He stated that a wide variety of vegetable substances has been tried in diabetes. Myrtillin has given varying results in dogs. There are two substances present in association: (1) myrtillin, which lowers blood-sugar; (2) a substance which raises it. These two substances occur in all plants and belong to the anabolic-catabolic activities of plants. If myrtillin is effective at all it is as effective in doses of 1 gr. per day as in doses of 30 gr. The effect is to stabilize blood-sugar reactions when administered orally. Myrtillin is standardized by reactions in dogs. The results are the same when given by mouth or by vein, the effect lasting for days or even weeks. The effects in dogs can be duplicated in patients with mild diabetes, but cannot be demonstrated in the rabbit or the rat. Experiments on dogs show that these animals cannot survive depancreatization more than a week; functions are depressed, resistance lowered, infections cannot be cured, wounds do not heal. When myrtillin is used, started one day before operation, pancreatectomy is performed, and the animals are then fed on meat, milk, and bread, they hold their weight and maintain strength. They play and fight, and seem lively, the wound heals, and minor infections are overcome. The myrtillin-treated dogs are generally superior to insulin-treated dogs. Life can be maintained for some weeks or indefinitely. The experiment of partial pancreatectomy is better because it resembles human diabetes. With nine-tenths of the pancreas removed there is severe

diabetes, which can be controlled by myrtillin. If only one-fiftieth of the pancreas is left the animals cannot survive even with myrtillin. Autopsy shows hypertrophy of the pancreas remnant. The first step in therapy is to make the urine and blood normal with insulin or diet, and then to give myrtillin and then watch for gradual building up of tolerance. It is necessary to use patients who have been studied over a number of years to guard against spontaneous gain in tolerance. In a series of eighty-one this condition excluded twenty-four patients, and of the remaining fifty-seven, twenty-one were failures, thirty-six were positively benefited, six patients had never received insulin, and fifteen patients were able to reduce insulin and increase diet. The remaining six patients were able to discontinue insulin.

Conclusions.—Myrtillin can be administered orally. It is harmless. It builds up tolerance. On the other hand, it is less prompt, less powerful, and less certain than insulin. It has a certain number of failures. The method deserves clinical trial, but should not be considered as a substitute for insulin.

DR. J. C. MEAKINS (Montreal) discussed the *Reaction of Chronic Nephrosis to Thyroid and Parathyroid Medication.*

Improvement has been noted, he said, in nephrosis as a response to thyroid and parathyroid medication. The effect is due to the readjustment of the calcium metabolism which has been studied. In a woman, aged thirty-three, with recurrent attacks of oedema which was resistant to diuretics, the patient was put on thyroid medication with good result. The urine contained casts and red cells. The urea was normal. The blood calcium was low. Put on parathyroid extract, 50 units a day, there was a prompt increase in serum calcium, marked increase in urine output, and drop in weight. When the parathyroid was stopped the oedema returned. In another case, a girl with oedema and ascites, and a reverse of the albumin globulin ratio, there was an increase in blood cholesterol, the blood calcium being low. There was no response until the eighth day. This was a case of mixed glomerular nephritis with nephrosis. In another case a man, aged twenty-four, with oedema, the parathyroid had no effect on the weight. With high protein diet there was response in weight, but none in the plasma protein. A drop in weight followed thyroid medication. The cholesterol in the blood dropped. There is evidently an endocrine imbalance in these cases which varies in different patients; sometimes thyroid is effective, sometimes parathyroid. Sometimes it is not due to calcium disturbance.

Medico-Legal

THE LAW AND ETHICS OF MEDICAL
CONFIDENCES

*An Address by Lord Riddell Delivered before the
Medico-Legal Society in London*

An address which would appear to have much interest for the profession in Canada, was delivered before the Medico-Legal Society in London by Lord Riddell, on the Law and Ethics of Medical Confidences. In both law and ethics medical confidences are regarded as sacred, with certain exceptions and these exceptions may be grouped as follows: When may the doctor tell? When should he tell? When must he tell? On these points there is considerable differences of opinion in both legal and medical circles. The rules of medical secrecy arise out of the fiduciary relationship which exists between the doctor and his patient, which is similar in some respects to that between the solicitor and his client. In England there would appear to be a curious absence of direct law on the confidential relation between doctor and patient; an absence which must be considered highly creditable to the medical profession. If the traditional obligation had been frequently or flagrantly dishonoured, many laws would doubtless have been recorded. There are, however, not a few legal cases which show that the courts regard professional secrecy as a grave moral duty which must be enforced; therefore notwithstanding the absence of any direct law, we are entitled to assume that a doctor would be legally liable for damages sustained by his patient from a wrongful disclosure of the patient's confidence. Moreover, in some European countries, such as France and Germany, the disclosure of medical secrets is a criminal offence, and in Germany the rule includes midwives and apothecaries. The legal position in England, may be stated as follows:—

First: A doctor being in a fiduciary capacity must preserve his patients' confidences, unless relieved from the obligation by some lawful excuse. *Second:* Legal compulsion, or the patient's consent are lawful excuses; and the performance of a moral or social duty may also be a justification. A necessary protection of the doctor's interest may also justify some disclosure. *Third:* There is no legal privilege for medical confidences similar to the privilege enjoyed by the solicitor for the confidences of his client. If called as a witness the doctor must answer such questions as may be put to him by the Court. *Fourth:* A doctor shares with other citizens the duty to assist in the detection and arrest of a person, who has committed a serious crime.

These first propositions will not be disputed on ethical grounds and every doctor admits that patients' confidences must be preserved. A

breach in this rule may result in serious legal consequences, and may also bring upon the discloser the censure of the General Medical Council for unprofessional conduct. Many doctors are not as reticent as they might be. A surgeon who spends his days in removing appendices and gall stones, or in performing hysterectomies may not realize that his patients desire to preserve the secrets of their truncated anatomies. As a rule, if the doctor gossips, he only does so in connection with matters he regards as immaterial. If medical advertising were permitted, however, I am sure that the sign reading: "Dr. Blank is a regular oyster, he never talks about his patients," would be considered a valuable recommendation by the public. Some doctors think they are entitled to disclose their private patients' secrets to other medical men or to their students. This is a mistake. Medical freemasonry does not justify such disclosures. The symptoms and treatment may be stated, but not the patient's name.

The conditions demanding disclosure raise more difficult questions. Legal compulsion is admittedly a lawful excuse, whatever it may be from the point of view of medical ethics. When we come, however, to the performance of a moral or social duty, we are faced with serious problems.

An interesting discussion* followed the reading of this paper and in his summing up as President, Lord Justice Atkin said that he had no doubt that subject to certain qualifications it was an implied term of contract of employment as a medical man that that medical man would not disclose to the disadvantage of the patient the information he obtained. He thought that the physician was under no obligation to withhold information obtained from a patient that a crime was about to be committed. He was not dealing with whether it was the doctor's duty to volunteer information, but only with the point as to whether it was a breach of the contract if he did disclose it. It was plain that, in law, he was obliged to disclose the information he obtained from the patient if he was called upon as a witness in a court. There might be two opinions as to whether that ought to be the law, but there could not be two opinions as to whether that was the law at present. There might be involved large questions of social duty, as Lord Riddell had pointed out, all of them admittedly difficult questions; and circumstances might arise in which either the contract did not extend to withholding information in such circumstances because the contract duty would conflict with an urgent and strong social duty; or that, though the doctor might be under a contract to his patient, yet it might be his duty, as a citizen and a man of

* The Lancet, July 2, 1927, p. 14.

honour, to break his contract, for there might be occasions on which a breach of contract was, ethically, justifiable. While a doctor might expose himself, technically, to an action for breach of contract, yet a court, in dealing with the matter, would always have to deal with the question of damages, and in such a case as he was predicated it was difficult to conceive that any jury or any judge would be likely to impose the burden of substantial damages upon him. As a rule, the contract was made with the person who employed the doctor. A very obvious case would be that in which a doctor was employed by an insurance company to report on the condition of a proposed assuree. It was plain that in such a case the doctor's contract was with the insurance company, and he could disclose to the latter the information he derived from the examination. He imagined that most doctors would consider themselves under a professional obligation not to disclose unnecessarily the information obtained from the examinee, who, however, was not a contracting party. That obligation it was very important to maintain. It was of public importance that persons should be able to have recourse to doctors in full confidence, so that they might fully disclose to them their disease and their history, without any anxiety that such would be made public. In regard to no class of case was it of more importance than concerning venereal disease. He could not understand how it would ever be possible to ensure the satisfactory treatment of venereal disease, so that people suffering from it would come for treatment in its early stages, or as soon as they could, unless there could be an absolute guarantee against publicity. It was of extreme moment that this confidence should be maintained. When dealing with the legal obligation to tell, he felt there were a great many cases in which the judge should exercise discretion. There were instances in which the judge could tactfully say he did not think it would be to the public disadvantage if the information were not disclosed.

As to disclosure to a third person of a confidence reposed by the patient—*i.e.*, where a wife was suffering from syphilis—the question for decision was whether the information should be imparted to the husband. He could hardly imagine a doctor in such circumstances as were related failing to take steps in some way to protect the young innocent husband and children. No doubt the obvious course was to insist on getting the permission of the patient to inform the husband. But each doctor must be the arbiter as to his own honour in particular circumstances. The other question, namely, that in which the patient was suffering from a venereal disease, the question was whether he or she herself should be told the nature of the disease.

That did not involve a breach of professional confidence, and the President saw no difficulty in dealing with the position. He had often wondered why a doctor should so often feel it was within his discretion to refuse to tell a patient what he was suffering from. His own feeling was that if he asked a medical man what he was suffering from he was entitled to know, and if the doctor refused to give the information, he was taking upon himself a serious responsibility, even though it might be argued that the refusal was in the patient's interests. As to the case where the doctor found the genital organs of a wife to be absent, that was a case for the doctor's discretion; the judge was not so well qualified to form an opinion as to what course to take as was the doctor himself. It did not seem to be the kind of case which involved a social duty to the husband. The doctor must use his discretion as to whether he would induce the wife to impart the information to her husband. He, the speaker, agreed that in such case marital relations were seriously affected, but there were cases in which, apparently, happy marital conditions continued between the parties, even where one or other party was unable to perform the ordinary marital duties, and there would be a difficulty, in such a case, in supporting such disclosure without the consent of either husband or wife. It differed from the case in which to continue marital relations involved the infliction of cruelty—namely, in imposing on the innocent party the risk of venereal disease.

The question of abortion was of immense medico-legal interest. This practice was very prevalent. Everybody must sympathize with the view of that great judge, Justice Hawkins—who had a kind heart—when he said that for the doctor to feel himself under an obligation to give up his patient as having herself committed a criminal offence when she was, perhaps, suffering from peritonitis, would be a monstrous thing. With that the President agreed. If a woman who had been suffering from the effects of abortion could not consult a doctor without being exposed to the risk of being sent to penal servitude, it would mean that more women would die from this cause than at present, and that women suffering in this way would be deprived of humane treatment. It might very well happen that a physician could procure from the patient the name of the abortionist, and he might be able to give to the police a hint that in a particular—unnamed—case there were grave reasons for suspecting that such a person was carrying on business as a professional abortionist. But it would be a different matter when death was impending.

Lord Riddell briefly replied.

Abstracts from Current Literature

MEDICINE

Studies in the Epidemiology of Acute Rheumatic Fever and Related Diseases in the United States, Based on Mortality Statistics.

Atwater, R. M., *Am. J. Hyg.*, 1927, vii, 3.

It is only recently that our ideas on rheumatic fever have assumed a definite shape as regards its clinical features. While it is now generally held that "acute rheumatic fever is a disease caused by a living parasite, which gains access to the body from without, and which produces the picture of a communicable disease," there is no general agreement as to the causal agent, its mode of transmission or the means to be employed for prevention.

These studies on the epidemiology of the disease bring out several interesting points. There is, first, evidence of a striking decline throughout the United States in the numbers of deaths and probably in the cases as well. This decline has been most marked in the northern regions, where the disease is most prevalent, but it has also been noted throughout the whole country. Much of this decrease in mortality, with which there is nothing comparable in England and Wales, is partly explained by changes in the classification in the U. S. registration of diseases. Before 1910, deaths from chronic rheumatism confused the situation, as was shown by the high percentage of deaths at an advanced age; but under the new ruling there has been a more careful differentiation of acute rheumatic fever from the chronic forms of arthritis shown by the more recent statistics.

On the other hand, this more careful differentiation of the disease has been accompanied by an extension of the diagnosis category to include conditions not previously recognized as rheumatic fever, together with an improvement in diagnostic skill. These points offset the other factors producing the decline in the rate which may therefore, be considered as a genuine decrease. In consequence the records of deaths from rheumatic fever are considered to be collectively trustworthy enough to provide broad conclusions on a statistical basis, although it is recognized that registrars follow different rules for selecting the primary cause of death when rheumatic fever is one of the reported causes.

The seasonal variation in the death rate from rheumatic fever is quite marked, and the age and season curves show an essential independence from those assigned to acute endocarditis and pericarditis. The coloured races of both sexes show a significant excess in the mortality rates from this disease, which is all the more significant because most of the coloured population live in those States where the disease is not so prevalent among the white population.

Perhaps the most interesting point, however, is the confirmation by statistical studies of the modern view that rheumatic fever belongs to the group of communicable diseases. Its seasonal and climatic variations, its age, sex and racial characteristics, its case fatality by ages, its prevalence among those exposed in war, and its analogies with the prevalence of certain streptococcal diseases are all in accord with this view. When rheumatic fever is compared with scarlet fever, chorea, erysipelas, septicæmia and puerperal fever, it is seen that the tendency of these diseases to vary from year to year corresponds very closely with the variations that occur in rheumatic fever. This correspondence is found in both English and United States records. It is this similarity of variation, along with bacteriological and clinical resemblances which forms additional evidence that acute rheumatic fever belongs to the family of streptococcal infections.

H. E. MACDERMOT

Intravenous Injection of Ouabain in Man.

Wyckoff, John and Goldring, William, *Arch. Int. Med.*, April, 1927.

The authors conducted their experiments in the third medical division of Bellevue Hospital. For the past five years they have been making controlled observations on the preparations, dosage, absorption and evidences of the disappearance of the digitalis bodies in patients suffering from heart disease. They found that absorption from the gastro-intestinal tract was so rapid and uniform, and when given in maximum dosage, complete digitalization took place so promptly (within six to eight hours) that little practical need was felt for giving the drug intravenously.

However, some patients cannot tolerate digitalis either by mouth or by rectum, and the authors wished to study the effect of giving ouabain intravenously. The drug is amorphous strophanthin. The intravenous dosage of the drug has varied greatly with different workers. Some have been convinced that not more than 0.5 mg. in twenty-four hours was sufficient, while other workers have administered as much as 1.1 mg. in two hours. The administration by the fractional method is the one generally favoured.

The writers made a study of the intravenous dosage of ouabain necessary to produce therapeutic effects, the time required before its action developed and its duration. In all, twenty-eight patients with auricular fibrillation, three with regular sinus rhythm and one with auricular flutter received 248 injections. No patients who had received digitalis within two weeks were given ouabain. The technique was 0.5 mg. given intravenously followed by 0.1 mg. every half hour. The first noticeable effect was a definite ventricular slowing which persisted.

Full therapeutic effect was considered to have been obtained when the ventricular rate was slowed to eighty or below, with obliteration of the pulse deficit.

As stated above, 248 intravenous injections were given to thirty-two patients who had heart failure, and no fatalities occurred. One hundred and sixty three of these injections were followed by a definite cardiac effect. The initial effect was noted in from 5 to 25 minutes, and the maximum effect in from 15 to 50 minutes. As a rule the larger the dose, the earlier the initial effect and the more delayed the maximum effect.

A greater amount of ouabain was necessary to reduce the ventricular rate in patients who had auricular fibrillation with elevation of temperature than in those without elevation of temperature.

The variation in dosage was less when calculated on the basis of body weight than on the basis of total dosage. The persistence of action of the drug varied, but was never longer than five days.

It would seem that ouabain, if given in fractional doses may be administered with safety intravenously to patients with auricular fibrillation, that have not received digitalis recently. When ouabain is given to patients with regular sinus rhythm greater care must be used.

L. C. MONTGOMERY

Study of Antituberculosis Vaccination With Bacilli Calumette Guérin. Tzekhnovitzer, M., (The Ukrainian Commission), *Ann. de l'Inst. Pasteur*, 1927, xli, 322.

Experiments were performed to test the innocuousness of B.C.G. for laboratory rodents, cattle and horses, the protecting properties of such vaccination and its biological effect on the organism. His conclusions are that B.C.G. is inoffensive for guinea pigs, rabbits and cattle; it produces tuberculin and sensitizes the vaccinated animal to tuberculin and to tubercle bacilli injection; it forms specific granuloma, the tubercles disappearing in six months; not being progressive and transmissible in series, nor is the virulence raised by animal passage. The vaccinated animals show less extensive tuberculosis and live longer than controls when tested by a subsequent inoculation of virulent tubercle bacilli but are not entirely free of tuberculosis.

ARNOLD BRANCH

Effects of Massive Intravenous Infection of Bacilli Calumette Guérin. Conland, E., *Annales de l'Inst. Pasteur*, 1927, xli, 289.

When 15 mg. of B.C.G. are inoculated into rabbits intravenously, the dose is well tolerated. The animals develop small follicles in the lungs, liver and spleen which completely disappear without scar formation in 150-200 days and no bacilli remain. No lesions occur in the other organs. The follicles are composed of epithelioid cells, lymphocytes and small giant cells

which are comparatively rare. They contain a sparse number of bacilli. Cessation does not occur.

ARNOLD BRANCH

Epilepsy in Childhood. Peterman, M. G., *J. Am. M. Ass.*, June 11, 1927.

The personality defect or constitutional inferiority found in so many cases of essential epilepsy is an inherited defect, and can be demonstrated in the behaviour disturbances and reaction patterns that distinguish epileptic children.

The character of the disease, the usual progressive degeneration and the constitutional defect classify epilepsy with the heredo-familial degeneration or abiotrophies. The disease may begin at any age, generally before twenty years of age: in about half the cases it begins with *petit mal* attacks. Children with spasmodophilia rarely develop epilepsy.

The immediate cause of the epileptic convulsion is probably a disorder of metabolism and may be a shift of the acid base equilibrium toward the alkaline side. The tendency to alkalosis is not the only factor, since this may occur without provoking a convulsion, but the common history of gastric and intestinal disorders, the nature of status epilepticus and the increased toxicity of the urine during attacks, are all suggestive of metabolic disturbances.

The treatment of idiopathic epilepsy consists of diet, phenobarbital and psychotherapy. The influence of the psyche is well-known. A complete change of environment usually causes a temporary cessation of attacks. Phenobarbital is rapidly supplanting bromides. The dosage must be carefully regulated. This drug has little effect on *petit mal*. Starvation is very effective as a temporary procedure, but the attacks recur when food is given.

During fasting certain changes occur in the blood chemistry. There is a considerable increase in the excretion of ketone bodies and in the blood, alveolar air, and urine; an increase in the blood uric acid, a slight drop in the blood pH, and usually a fall in the blood sugar.

The ketogenic or high fat diet in the treatment of epilepsy was described in 1924. The diet is a low carbohydrate, low protein, high fat ration adjusted to the individual patient. It is preceded by at least one week of starvation, during which time the patient is kept in bed and water, clear broth and bran wafers given freely. At the end of the starvation period the ketogenic diet is started. The requirements are calculated at thirty calories per pound of body weight, but the total amount of calories should not exceed 1,800 or 2,000. Children under five years of age are given 20 gm of carbohydrate and 1 gm of protein per kilogram of body weight, with the remaining calories supplied in fat. Vitamins and mineral salts must be supplied, and water is given freely. Any tendency to nausea can be quickly controlled with orange

juice. When diacetic acid appears in the urine the attacks usually cease or are greatly diminished in number.

When the attacks are under control the diet is continued for three months longer. If no further attacks occur the carbohydrate is increased ten gm. During the next six months the carbohydrate may be increased ten gm. and the protein five gm. in alternate months, and the fat decreased in proportion. Restriction of protein, as above described, is essential, otherwise the specific dynamic action of protein, possibly the amino-acids and the derived glucose seem capable of harmful results. It has been demonstrated that children over five years of age grow and develop normally and maintain a positive nitrogen balance on 2-3 gm. of protein per kilogram of body weight.

Dr. Peterman reports fourteen cases of epileptic children who have completed the ketogenic treatment and are now on normal diet. All these children have been free of epileptic attacks for periods varying from six months to three years after the change to normal diet.

A. G. MORPHY

SURGERY

Heliotherapy in Surgical Tuberculosis. Allison, Nathaniel, *Surg., Gyn. & Obst.*, June, 1927.

Surgical tuberculosis includes all those manifestations of tuberculosis hitherto regarded as surgical lesions and so localized as to be amenable to surgical treatment. The group includes lesions of the bones, joints, kidneys, glands, skin and eyes, each of which are caused by infection of the tubercle bacillus. The disease in these areas has become localized and gives local evidence of its presence. In the case of the bone or the synovia, the bacilli have gained a foothold in glandular structures and are carried to these areas by the blood stream.

The advance in treatment of surgical tuberculosis which heliotherapy has given depends entirely upon the realization that the local disease process is of secondary importance, and that the treatment of a tuberculous individual is the prime consideration. In short, tuberculosis must be fought by raising the powers for resistance to the highest possible point. Zinsser believes that the essential mechanism of resistance to the tubercle bacillus may be found in the activity of the cells making up the specific inflammatory reaction recognized as the "tubercle." The insolubility which is conferred on the tubercle bacillus by its waxy constituents necessitates the production of a mechanism different from that which underlies other bacteria, leading, as Krause states, to a definite ability on the part of the tissues to "fix" the bacillus. This, he regards as a specific immune reaction.

There is an abundance of clinical evidence that heliotherapy will raise the resistance of the tuberculous patient, especially in the localizations

of the disease. The skin has powers of elimination, circulation, innervation, and nutrition. Where the skin is well browned, and its capillaries are used to draw the blood from the deeper layers, the muscles and joints regain their former tone, and the lesions in the structures heal, abscesses calcify, and complete reconstruction takes place in time. The healing process is aided by the functional use of the muscles.

The great disaster in surgical tuberculosis is multiple infection. Therefore, abscess formation must be severely let alone until the content reaches the subcuticular region. Then, and not until then, is the abscess ready for aspiration. The author states that the catastrophe of surgical tuberculosis is surgical interference, and much more can be accomplished by rest with the patient exposed to sunlight. Surgical interference is dangerous at best, and leads to disaster in most cases, except in renal tuberculosis which leads to the removal of the tuberculous kidney.

The patients, while having heliotherapy, use their muscles and move diseased joints as much or as little as they wish. Spinal disease is treated by recumbency, without braces or jackets. Hyperextension of the spine is actively encouraged so that the erector spinae muscles become well developed. During convalescence, the splint used for protection is of the lightest type possible.

We know that the healing of the lesions such as occur in bone and joint cases requires the filling in of the destroyed areas by fibrous tissue; that joint cartilages once destroyed are not regenerated, and that ankylosis in good position is a fortunate result in a good many cases. Operations designed to assist nature in this healing are useful.

R. V. B. SHIER

Mesenteric Cysts. Swartley, William Blaine, *Ann. Surg.*, June, 1927.

Cysts of the mesentery are interesting because of history, rarity, origin and disputed classification, and the infrequency of accurate diagnosis. The genesis of mesenteric cysts was, until recent years, rather obscure. They were considered as a condition of lymph stasis with dilatation of the lymphatic gland or vessel. In 1900 Dowd wrote an article which aroused renewed interest in the subject, and recently important work has been done. Dowd classified mesenteric cysts according to their origin into: (a) embryonic, including dermoids, serous, chylous, hæmorrhagic, and cysts with walls like that of intestines; (b) hydatid; (c) malignant disease. Various other classifications since 1900 have been offered, but it is plain that we are coming to regard mesenteric cysts as not of parasitic or malignant but of embryonic origin. A metastatic malignant tumour of the mesentery or a primary one which undergoes cystic degeneration, is not morphologically a cyst.

Mesenteric cysts must be carefully distinguished from large cysts of the kidney, occurring generally singly and apart from chronic nephritis,

congenital cystic disease, and echinococcus infection.

In regard to symptomatology and diagnosis there are no signs or symptoms which are pathognomonic. The tumour is, as a rule, smooth, rounded, cystic and generally mobile. The diagnosis is often difficult, which is proven by the fact that no case has been recognized with certainty previous to operation or autopsy. As a result of pressure, there is pain and obstructive symptoms; a history of repeated attacks of abdominal pain associated with vomiting, and often with alternating attacks of diarrhoea and constipation is significant. The obstructive symptoms may lead to narrowing of the bowel lumen and cause absolute obstruction. Small cysts may give rise to no symptoms whatever. As the cyst becomes larger, it must be differentiated from an ovarian cyst, retroperitoneal growth, hydronephrosis, movable kidney, pancreatic cyst, new growth of the intestine and the pregnant uterus.

The complications are intestinal obstruction, peritonitis, hæmorrhage into the cyst, rupture of the cyst, torsion of the cyst and, if the cyst occupies the pelvis, it may become impacted and give rise to symptoms varying with the organ upon which it presses.

The treatment falls into two types. If the case is acute and the patient suffering from obstruction or peritonitis, the treatment is directed towards these conditions primarily. If the operation is an elective one, drainage, enucleation, and resection, are the procedures adopted. Drainage is apt to result in a persistent sinus. Enucleation, if it can be safely accomplished, is the ideal. Resection in Miller's series gave a death rate of 60 per cent.

The author concludes this paper by quoting the definition as used by Higgins and Lloyd that "True mesenteric cysts are those which occur in or near the mesentery and which are not malignant, dermoid, or parasitic, and do not arise in any normally placed retro-peritoneal organ." Such cysts can be classified as: (1) cysts of embryonic origin arising from mesodermal remnants; and, (2) cysts of intestinal origin—(a) arising in most cases as diverticula from the bowel during development and (b) sometimes derived from persistent portions of the vitelline duct.

R. V. B. SHIER

Traumatic Cyanosis; Its Pathological Physiology. Rosenblatt, Millard S., *Ann. Surg.*, June, 1927.

Traumatic cyanosis, or asphyxia, is produced by the suspension of respiration for a time, due to enforced compression of the thorax, or thorax and abdomen. The result is a purplish discolouration of the head and neck, subconjunctival hæmorrhages and a generalized reaction which may or may not terminate in death. The author does not agree with Green's statement that most cases recover, for there are many reports of cases dying after crushing injuries sustained in panics and mobs.

In discussing the condition the author cites the case of a Polish labourer, who was admitted to Harper Hospital, Detroit, in February 1926, after having been crushed against a stone wall by a steam shovel. This case went on to recovery and was reported two months after discharge from the hospital as being free from cyanosis.

The type of injury is usually a crushing one of the chest and abdomen. The patients are usually injured in crowds or panics, elevator accidents, or injuries by trains or other vehicles. The colour of the skin of the face, head and neck varies from dark red to purple and is described as both discrete and confluent. It extends down to the third rib on the chest and on the back to the lower border of the trapezius muscle. Subconjunctival hæmorrhages are common and convulsions may occur.

The aetiology of the cyanosis has been much debated. Hueter says that: (1) it is due to the extreme distension and rupture of the vessels of the skin from the sudden upward pressure; or, (2) that, due to the trauma, there is sympathetic nerve paralysis leading to vasomotor paralysis, which leads to the distension of the vessels with blood. There is not, as a rule, extravasation of blood outside the vessels and, on microscopic examination of the involved skin, the tissues are found normal except for dilated vessels. The theory of sympathetic nerve paralysis is the most favoured.

There is sometimes severe ocular or visual injury, resulting in optic atrophy, retinal hæmorrhage and degeneration.

R. V. B. SHIER

It is a habit with us Americans to emphasize the importance of our national wealth but always in terms of real property, machinery, and of manufactured products. We quite forget that human life exceeds in value all such goods by a very large margin. Human capital is the nation's greatest asset. No wonder that we are wasteful of our human resources. We appreciate the value of life and health only when we lose them. It is when earnings cease through illness, and expenses mount that we recognize the value of life and

health. It is when the bread-winner of a family is removed through accident or disease and the mother and young children must become self-supporting that, first the dependents, and later the community, realize the large capital value which has been lost. But, even if such circumstances bring us the realization of the value of the individual, we give ordinarily little thought to the value of our living assets as a whole.—*Can. Public Health Jour.* Louis I. Dublin, May 27, 1927.

Obituaries

Dr. Campbell Meyers. In the death of Dr. Campbell Meyers the Canadian medical profession has suffered a severe loss. His neurological work, and particularly his contribution to the study and care of patients suffering from functional nervous disorders and the minor psychoses, was of enduring value and is worthy of grateful recognition by our profession. In his private neurological hospital and in the nervous wards of the Toronto General Hospital, Dr. Meyers set an example in the study and treatment of nervous disorders that cannot fail to leave a permanent impress upon those who were familiar with it.



DR. CAMPBELL MEYERS

The advances in the theory and practice of psychiatry in Canada and in the United States during the past two decades represent one of the most important movements in the medicine of our time. Formerly medical students received but little training that was helpful to them in the study and treatment of functional nervous diseases and mental disorders, but recently our knowledge of the thinking, the feeling and the striving of human beings has made progress by leaps and bounds. To-day the physician who is not prepared to recognize the nature of intellectual and characterological disturbances when he meets them in his practice and who does not know how to arrange for their proper care must be seriously handicapped in his work.

The establishment of wards for functional nervous disorders and for mild mental and emotional disturbances in connection with the other wards of general hospitals has been a most important influence in spreading the knowledge that modern psychiatry has yielded and in leading medical students and practitioners to a recognition of the great importance of these disorders in everyday practice. The advantages of the neuropathic wards in the Toronto General Hospital quickly attained recognition, and for this the profession must always be deeply indebted to the enthusiasm and the activities of Dr. Campbell Meyers.

In the domain of mental hygiene, too, Dr. Meyers has been one of the foremost Canadian workers. In functional nervous disorders, as elsewhere in medicine, prevention is often far more important than attempts to cure after disease has been well established. The mental hygiene movement has come to stay. It is based upon a sound foundation. Studies of the causative factors in patients who enter neuropathic wards of general hospitals will always be most helpful for the development of prophylactic measures.

Though Dr. Meyers was not a prolific writer, he made a number of important contributions to medical bibliography. His papers upon "Some eye symptoms in hysteria," upon "Hysteria in the male," upon "Neurasthenia in some of its relations to insanity," and upon "The Canadian soldier and shell shock," will be recalled with gratitude by those who have read them. They have done much to interest general practitioners in forms of disease with which they were not sufficiently acquainted. Dr. Campbell Meyers was a pioneer in a field which from now on will undoubtedly be more intensively cultivated. LLEWELLYS F. BARKER

Dr. E. J. Rothwell, of New Westminster, died suddenly at Quesnel on June 30th while on a fishing trip with his son in the Blackwater region. He was taken suddenly ill with severe hamatemesis resulting from an acute gastric ulcer. Dr. Baker, pioneer physician of that district, attempted to transfuse some of his own blood in the hope of saving his patient's life, but unfortunately the sacrifice was in vain.



DR. E. J. ROTHWELL

Dr. Rothwell graduated in 1896 from the University of Toronto and after practising a short while in

Eastern Canada went first to Trail, but a few years later, in 1902, settled at New Westminster. He took a keen interest in provincial affairs and in June, 1924, was elected to the British Columbia Legislature, defeating the conservative candidate, Rev. Dr. O. M. Sanford. His ability was promptly recognized and he was made Chairman of the House Committee on Agriculture, where with notable tact and ability, he succeeded in framing and getting passed the Market Control Bill, from the passage of which much is hoped by the fruit growers of the Okanagan Valley.

Dr. Rothwell was justly popular among all classes, and was recognized by all as an able physician, and an honourable, conscientious public representative. He is survived by his widow and one son Sheldon who was with him when he died.

Dr. J. C. Elliott, of Chilliwack, passed away on July 4th, following severe injuries received when his car and a B.C. Electric special train from Vancouver to Chilliwack, collided on a crossing in Sardis, three miles south of the city. He was returning from a professional call. The car was carried a distance along the track, and Dr. Elliott received severe injuries in the head and chest, as the result of which he passed away without regaining consciousness.

Dr. Elliott was born near London, Ont., in 1873, and took his medical training in the Western University of that city. After his graduation in 1905, he commenced practice in Lethbridge, Alberta, but shortly afterwards moved to British Columbia where after some changes he settled in the Chilliwack Valley fifteen years ago.

Hardworking, zealous and self-sacrificing to a fault, no call for aid was ever refused or neglected by him no matter what his own physical condition—never very robust—or the circumstances which might exist at the time; no night was too dark, no road too long or difficult, and no patient too poor. He had a high ideal of his professional calling and on its relation to his fellowmen. He had a remarkably even and cheerful temperament and thought kindly of all.

Dr. Elliott was particularly interested in the health of children and one of his ambitions was to see some scheme worked out here whereby all children of school age should receive treatment when necessary and that all that influences retarding growth and development might be removed. His hobby was music of which he was very fond. He was the moving spirit and inspiration of the Chilliwack orchestra.

His sudden and tragic death has occasioned universal regret throughout the district.

Dr. Elliott is survived by his father, Mr. James Elliott of Vancouver, one brother Norman of Windermere Valley, and his wife and two children.

His funeral which was conducted under Masonic auspices was very largely attended.

Dr. A. E. G. Forbes. The death of Dr. Forbes, of Lunenburg, N.S., which occurred on July 3rd, is sincerely mourned by a very wide circle of friends. Death resulted from an infection acquired while performing an emergency operation about ten days previously. Dr. Forbes located at Lunenburg after graduating at McGill in 1906. He quickly established himself in the confidence and affection of the people, and built up a large practice. He kept in close touch with progress in surgery, and was some years ago admitted to the fellowship of the American College of Surgeons. His interests, however, were not restricted to professional matters. He entered heartily into civic and other affairs, and was repeatedly elected to the Lunenburg town council by majorities which clearly indicated the esteem in which he was held by the public. Every good cause could count upon his warm support. A very large funeral and an exceptional number of floral tributes testified to the admiration in which he was held by the people of his community.

Dr. Frederick Warrington Stockton, well known throughout Alberta as a pediatrician of high standing, died at his home in Calgary on June 25th, in his 60th year. He was born at "Hillside Farm" near Paris, Ontario, and came of United Empire Loyalist stock.

His education was received at Woodstock College and later at Toronto University, where he graduated in Medicine in 1894. After practising in Ontario for some years he went abroad in 1900, spending over a year in London and Berlin. Coming west in 1902, he settled in Okotoks, Alberta, where in 1905 he was elected the first mayor of the town.

In 1914 Dr. Stockton decided to devote his future practice to paediatrics, and in preparation spent some time in London at the Great Ormond Street Hospital, followed by a year under Dr. Emmet Holt in New York. In 1915 he settled in Calgary, where he practised until his last illness. In 1923 he again visited London and then Paris, taking up further studies in paediatrics. During the summer of 1926 he went to the Mayo Clinic for further study, and it was while there that he developed the illness which lasted over so many months, and to which he finally succumbed.

Among his colleagues in Calgary Dr. Stockton was held in the highest esteem, not only because of his attainments as a pediatrician, but on account of his unsullied integrity. He was a man of strong personality and excellent judgment, and was greatly devoted to his work. In him the humanitarian side was always uppermost. He was a frequent contributor on subjects pertaining to his specialty both at the meetings of the Alberta Medical Association and of the Calgary Medical Society.

In 1905 he was married in Toronto to Miss Selina Smart, who survives him, together with one son, Harold, a student of medicine in Toronto University.

G. E. LEARMONTH

News Items

GREAT BRITAIN

ROYAL COLLEGE OF PHYSICIANS OF EDINBURGH

At an extraordinary meeting of the Royal College of Physicians of Edinburgh held on Tuesday, June 14, 1927, it was decided, in celebration of the Lister Centenary, to confer the Honorary Fellowship of the College upon: Arthur James Balfour, K.G., P.C. (Earl of Balfour). Sir John Ross Bradford, K.C.M.G., F.R.C.P.

(Lond.), F.R.S. Sir Hector Clare Cameron, C.B.E., M.D., LL.D. The Rt. Hon. Arthur Neville Chamberlain, P.C. Sir William Watson Cheyne, Bt., F.R.C.S. (Eng.), LL.D. Sir David Ferrier, LL.D., F.R.S. The Rt. Hon. Sir John Gilmour, P.C., D.S.O. Thorvald Johannes Marius Madsen, M.D., Director of the Statens Serum-institut, Copenhagen. Arthur Logan Turner, F.R.C.S. (Edin.), LL.D.

GENERAL

The American Dietetic Association will hold its tenth annual meeting in St. Louis, Missouri, October 17, 18, and 19, 1927. The headquarters of the convention will be at the Hotel Statler.

The association was founded in 1918 in Cleveland by a small group of dietitians to further the cause of all workers in nutrition and to determine the standards of the dietitian. From this small beginning the association has grown into a national organization of highly trained workers in nutrition and allied fields. The programme at the coming annual meeting covers all of these fields. Speakers are provided from among the laity and the medical profession who will discuss authoritatively the problems of each group, so that the latest word in nutrition will be brought before the association.

The New York Polyclinic Medical School and Hospital has opened its new Physical Therapy department, under the direction of Dr. Richard Kovacs, Adjunct Professor of Physical Therapy. This department will

serve for post-graduate teaching of doctors and nurses, and for clinical work in connection with a large general hospital.

Courses of lectures will be delivered in English in the Faculty of Medicine of the University of Paris and under its supervision on the following subjects: Recent developments in diseases of the chest and lungs by Professor Sergent and Doctor Rish, 12 conferences and demonstrations October 17th to 29th. Recent developments in gastro-enterology: 8 lessons by Dr. Bensaude, physician to the Saint-Antoine Hospital. At the clinic of nervous diseases: 14 lessons by Professor Guillaïn, October 17th to 24th. Diseases of the heart and vessels: 12 lessons by Dr. Clerc, October 17th to 29th. Puericulture and diseases of children: 24 lectures and practical demonstrations by Doctors Armand Delille and Weill-Hallé, October 3rd to 15th. Clinique of Professor Gosset: Surgery of the digestive tract and the liver with operative demonstrations and operations on the dog, October 10th to 15th.

NOVA SCOTIA

The training schools for nurses of several of the hospitals of Nova Scotia have held graduating exercises within recent weeks, and, as usual, on such occasions, the medical profession has been drawn upon for addresses. At St. Joseph's Hospital, Glace Bay, the exercises were made a part of the Silver Jubilee celebration, and the graduates were addressed by Dr. E. V. Hogan of Halifax. At the Glace Bay General Hospital, Dr. W. W. Patton, of Dominion, spoke to the graduates, while at the New Waterford Hospital Drs. J. C. Morrison, A. W. Miller and D. J. Hartigan shared in that pleasant duty. Dr. George N. Murphy, of Halifax, was the speaker at the Highland View Hospital, Amherst.

It is announced that Dr. Ralph Peterson Smith, who has held teaching appointments in pathology at the Universities of Glasgow and Durham and research appointments with the Medical Research Committee, has been appointed to succeed Dr. A. G. Nicholls as Professor of Pathology at Dalhousie University and Pathologist to the Victoria General Hospital. Dr. Smith's medical course was taken at Glasgow, where he was graduated with commendation in 1918. He served as surgeon sub-lieutenant in the R.N.V.R. in the war, and after graduation spent two years in Egypt with the R.A.M.C., being detailed to pathological and bacteriological work. Since his release from the army he has completed a thesis for the M.D. degree and has obtained the D.P.H. of the R.C.P.S., Ed. and Glasg. Dr. Smith comes to Halifax highly recommended for ability in teaching and research and for his personal characteristics.

On the day on which the diamond jubilee of Confederation was celebrated throughout Canada, the St. Joseph's Hospital, Glace Bay, celebrated its silver jubilee. When this institution was opened for the reception of patients on July 1, 1902, even its most enthusiastic supporters could scarcely have anticipated such a story of progress and usefulness as is contained in a very attractive booklet which has been issued to mark the completion of twenty-five years of splendid service. The credit for the foundation of the hospital belongs largely to the Reverend Father Ronald MacDonald, who associated with him a number of willing

co-workers and succeeded in persuading a doubting public that the hospital was not only necessary but feasible. Among the medical men who took an active interest in the establishment of the hospital were the late Doctors R. A. H. MacKeen and William MacKay, men who have left enduring memories of skill, kindness and cheeriness. For a number of years the administration was in the hands of the Sisters of Charity, but in 1915 this duty was transferred to the Sisters of St. Martha. This latter sisterhood had its origin in Antigonish, and had already proved its competency in hospital administration at the St. Martha's Hospital in that town. The cost of the original building was \$42,000.00, but subsequent enlargements, renovations, etc., have increased the sum invested to more than five times that amount. Several years ago the institution was listed as a standardized hospital by the American College of Surgeons. From the outset a progressive policy has been maintained, and the hospital has always enjoyed a well merited reputation for efficiency in every particular. From its staff went Drs. Kenneth A. MacCuish and Walter L. MacLean to gain distinction in the Canadian Army Medical Service and to die on the field of battle. Others, too, have gone the way of all flesh, while not a few have responded to the lure of larger fields where they have reached places of eminence. Of the original medical staff only Dr. M. T. Sullivan remains—the energetic and forceful dean of a group of doctors well qualified to uphold the splendid traditions of St. Joseph's, and to maintain her reputation for medical work of a high degree of excellence.

The Colchester-Hants Branch of the Medical Society of Nova Scotia held its annual meeting at Windsor on May 30th. Addresses were given by Drs. R. V. B. Shier and G. Harvey Agnew, of Toronto, and Dr. Smith L. Walker, of Halifax. Dr. G. K. Smith of Hantsport, was elected President; Dr. J. B. Reid, of Truro, Vice-President; Dr. H. V. Kent, of Truro, Secretary.

The annual meeting of the Cape Breton Branch of the Medical Society of Nova Scotia was held at Sydney on May 19th. The principal business was the completion of arrangements for the meeting of the provincial

society. The newly elected officers are: President, Dr. M. G. Tompkins, Dominion; Vice-Presidents, Drs. J. C. Morrison, New Waterford and J. B. Lynch, Sydney; Secretary, Dr. Eric W. MacDonald, Sydney.

The vital statistics of Nova Scotia for March last, recently reported by the Department of the Public Health, show that there were 807 births and 578 deaths during the month. The figures for the previous March were 1,041 and 574 respectively. As compared with March of 1926, there was a considerable increase in the number of deaths from pneumonia, which, however, was offset by a decrease in the deaths from tuberculosis and influenza. The infant mortality rate for the month was 105.3.

While en route to the meeting of the Canadian Medical Association, Sir Charles Sherrington spent a day or two in Halifax and made an inspection of the buildings of the medical school of Dalhousie University. He expressed himself as much surprised and pleased with the completeness of the equipment, the quality of research work being carried on, and the facilities for clinical instruction. He met some old friends and made several new ones, who were delighted to have the privilege of entertaining so distinguished a guest.

Drs. Finney and Simon of Baltimore, are spending the summer months, according to custom, at Chester.

At the annual meeting of the Western Nova Scotia Medical Association, held at Yarmouth on May 31st, Dr. G. W. T. Farrish, Yarmouth, was elected President. The Vice-Presidencies went to Dr. H. T. Pothier, Weymouth, Dr. L. P. Churchill, Shelburne, and Dr. A. R. Melanson, Eel Brook. Dr. T. A. Lebbetter, of Yarmouth,

was re-elected Secretary. Drs. Agnew and Shier, of Toronto, and Dr. Smith L. Walker, of Halifax, delivered addresses.

Dr. H. A. Grant, formerly of Halifax but now epidemiologist of the Virginian State Board of Health, spent the greater part of July holidaying in Nova Scotia.

Dr. Eva W. Mader, a recent graduate of Dalhousie and a daughter of Dr. A. I. Mader, Halifax, has been appointed to the medical staff of the Nova Scotia Sanatorium, Kentville.

In celebrating the centenary of Lord Lister's birth, the Royal College of Surgeons of Edinburgh elected seven honorary fellows, of whom Dr. John Stewart, Dean of the Medical School of Dalhousie University, is one.

Drs. R. B. Archibald and W. Sidney Gilchrist, who graduated at Dalhousie this spring, have gone to the United States to take positions as health officers in the area involved by the Mississippi flood.

Dr. Lewis Hunt, now of Richmond, England, was a recent visitor in Halifax and other parts of his native province. Dr. Hunt has resided in England for some time, and for several years served as Mayor of Richmond.

Dr. W. R. MacRae, of Whitney Pier, Sydney, narrowly escaped death recently, when the motor car in which he was driving was struck by a special train at a railway crossing. His car was demolished, but the doctor escaped with comparatively trifling injuries.

W. H. HATTIE

NEW BRUNSWICK

The forty-seventh annual meeting of the New Brunswick Medical Society was held this year at Chatham. Hospitality, provided by the physicians of Northumberland County, was most lavish. Official welcomes were delivered by the Venerable Archdeacon Forsythe of Chatham and Mr. Gerald O'Brien, Mayor of Chatham, as well as by Mayor Durick and the Honorable C. J. Morrissey of Newcastle. These two communities united in giving personal, as well as official welcome to the visiting physicians.

The entertainment provided, consisted of a banquet at Chatham, a dance, and bridge at the Miramichi Golf Club. Special arrangements were made for the ladies.

The scientific programme included the following: Dr. A. J. Grant of Western University Medical School, on "The operative treatment of hemorrhoids and kindred conditions under local anæsthesia." An address by Dr. Duncan Graham of Toronto University on "Constipation." A paper on "Gonorrhœa in the female" by Dr. A. D. Campbell of Montreal. "Infections of the hand" by Dr. G. G. Corbet of Saint John. "Physiotherapy and its relation to medicine" by Dr. W. F. Roberts, Saint John. A symposium on "Tubal pregnancy" by Dr. Victor Davidson, Saint John, Dr. J. B. McKenzie, Chatham, and Dr. L. G. Pinault, Campbellton.

The number of papers this year was made intentionally few so as to allow more time for discussion and this scheme apparently worked out to the satisfaction of the members.

The addresses by the visiting speakers do not require any laudatory remarks. The speakers are well

known and surpassed themselves in the excellence of their contributions. A word may not be out of place in regard to the symposium on "tubal pregnancy." This was given by three New Brunswick men and was based on figures gathered from the several hospitals in the province. The preparation of material had been painstakingly done. The presentation was brief, the important points were carefully brought out and, undoubtedly, the papers were worthy of the high praise which they received from all those who heard them.

The business of the meeting was prepared beforehand by the Executive and was concisely presented. The committee appointed to deal with Workmen's Compensation Board reported satisfactory results and expressed hopes of less friction in the future.

A motion was brought in advising new legislation, affecting one clause of the present Workmen's Compensation Act. This was considered and referred to the various local societies to come up at a special meeting of the society to be held later in the year. Another motion relating to the practise of chiropractors in the province, was also referred to this special meeting and will be reported upon later. A motion which caused some discussion was the wish of a certain number of the profession to do away with the local examinations by the new Brunswick Medical Council and to insist on the acceptance of the licenses of the Dominion Council of Canada, as the only basis for registration in New Brunswick. This was referred to special meeting.

The registrar of the Council, reported that an enabling legislation had been obtained to increase the annual fee for the New Brunswick Medical Society,

from \$3.00 to \$7.00 and that the fee was thereby increased from this date.

The Secretary, in his report, recommended that local speakers be made available to accompany or to collaborate with extra-mural speakers from university centres. They also recommended that the Secretary's suggestion regarding periodical health examinations be adopted, and that speakers be provided to give addresses on educational subjects relating to medicine to lay organizations.

The Presidential address by Dr. L. M. Curren of Saint John, created a most favourable impression. In it he reviewed the outstanding events of the past year and expressed appreciation of various improvements in the medical situation in the province. It is frequently felt that a President's address is a necessary evil, but Dr. Curran's address proved refreshing and stimulating.

The election of officers resulted as follows: President, Dr. J. B. McKenzie, Chatham, First Vice-President, Dr. J. C. Veniot, Bathurst. Second Vice-President, Dr. D. Ross, Fredericton. Secretary, Dr. John R. Nugent, Saint John. Treasurer, Dr. V. D. Davidson, Saint John. Additional members of the Executive: Drs. W. B. Rankin, Woodstock, A. Myers, Moncton, L. G. Peniault, Campbellton, F. M. Brown, Fredericton, A. M. Sormany, Madawaska, L. M. Curren, Saint John. The following were nominated to the Canadian Medical Association Council: Drs. W. B. Rankin, Woodstock, A. R. Myers, Moncton, G. Cloves VanWart, Fredericton, A. E. Macaulay, Saint John, Alfonse Sormany, Shediac. The Canadian Medical Association committees were re-appointed: Dr. A. Stanley Kirkland and Dr. L. G.

Pinault were re-appointed as Canadian Medical Association membership committee.

The invitation of Fredericton was accepted as a place where the meeting will be held in 1928.

Dr. H. A. Farris, Superintendent of the Saint John County Hospital, has returned to Saint John following a three months' sojourn in Europe, where he attended clinics in Great Britain, France, Switzerland and Vienna. He reports a pleasant meeting with Sir Henry Gauvain as one of the important incidents of his trip.

Dr. G. A. Strapp has completed his internship at the General Public Hospital at Saint John, and has established himself in practice at Harbour Grace, Newfoundland.

Dr. D. Grant, for the last two years assistant superintendent at the Saint John County Hospital, has severed his connection with that institution and has accepted a position at Ann Arbor.

Mrs. J. E. Paulin, wife of Dr. Paulin of Tracadie, is rapidly recovering from a severe abdominal operation performed at the Hotel Dieu, Chatham.

The new house staff for the Saint John General Public Hospital, comprises Dr. R. T. Hayes and Dr. W. H. Gavsie, graduates from McGill University, and Dr. H. M. Gardiner and Dr. D. W. Buchanan, graduates of Queens University. A. STANLEY KIRKLAND

QUEBEC

Four scholarships valued at \$2,000 each are being offered to prospective medical students at McGill University, according to an announcement made by the Faculty of Medicine. These scholarships have been donated by Mrs. R. M. Paterson, Mrs. Charles Meredith, Mrs. C. F. Martin, and Mr. Louis Colwell. The main object of the scholarships is to enable Canadian students to study at McGill when they might otherwise be compelled to take their course in a smaller place making less financial demand. Each scholarship is intended to carry the student through his medical studies at McGill with little expense to his family and himself. While fees in the McGill Faculty of Medicine are higher than previously, Dr. Martin stated that a record number of applications have been received for the coming academic year. As the number of new students entering the Faculty has been limited to 100, Dr. Martin explained that it is possible to make a selection. By far the majority of students will be accepted from the Canadian provinces.

Dr. G. E. Tremble, assistant in the nose and throat department of the Royal Victoria Hospital, has been granted the diploma of Laryngology and Otology from the Royal College of Physicians and Surgeons in London, England.

Dr. Philip Joseph of Montreal, has been awarded the Laura Spelman Rockefeller Scholarship.

The review of the fiscal year ending March 31, 1927, of the Canadian Tuberculosis Association, prints the following in regard to the five-year demonstration it has financed, thanks to the Provincial Government of Quebec, the Federal Government of Canada, the Canadian Red Cross and the Sun Life Assurance Company of

Canada. The demonstration has not yet received, although the funds are in hand, the entire third year's contribution, but has actually entered upon its fourth year of function. "The Three Rivers work is going on apace. School children were completely examined to the number of 4,416 this year, 48 being diagnosed tuberculous. Seven thousand one hundred and sixty-three additional citizens have been examined since the beginning of the Demonstration. A total of 114 have been diagnosed as tuberculous, having positive bacillary sputum, and 603 as suffering from the disease with sputum still negative. There are 146 contacts with positive sputum cases and 536 with negative sputum cases under observation. One hundred and five cases have been sent to sanatorium and 379 cases have been treated at the dispensary. There are 979 families now under supervision and the demonstration in 1926 knew of 10 cases of the disease for every death caused by it."

Two memorial tablets were unveiled recently at the Mount Sinai Sanitarium, near Ste. Agathe des Monts, in memory of the benefactors of the institution. The event took place under the chairmanship of Mr. Louis Solomon, president of the sanitarium, more than 150 people being present. The inscription of the founders was placed to the right of the main entrance. The memorial tablet bearing the inscription, "In Everlasting Remembrance" was unveiled to those who had remembered the institution in their bequests. Rabbi Dr. H. Abramowitz, speaking briefly praised the altruism of the founders and traced the history of the institution from its inception to its present day position, in which it is treating many patients and carrying on the fight against tuberculosis.

It had been hoped that rabies had at last disap-

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peared from Montreal Island, after the stringent precautions which have been taken for the last two years. Within the last two weeks, however, a carefully observed case has been reported by Dr. R. Bruce Malcolm which seems to have been rabies beyond any doubt. His dog, a small Sealyham, suddenly began to show signs of moroseness, irritability, lack of appetite, and, later, frothing at the mouth. It had always been muzzled, and had never wandered away from the doctor's house, hence the conclusion that it contracted the disease in the city. It was eventually destroyed, on June 24th, and microscopical examination of the central nervous system showed that there had been inflammation at the base of the brain.

The Quebec Provincial Bureau of Hygiene reports high figures for infantile mortality in the province during 1926. The average rate for the year was 145.8 per thousand, the highest figures being shown in August and September, namely, 182.0 and 183.6, respectively. The lowest rate was for December, the figure being 125.1 per thousand.

Among the chief items of interest connected with the opening of the academic year in the McGill Faculty of Medicine, will be the establishment of a new clinic in industrial medicine at the Montreal General Hospital. In addition to serving as a training school for physicians in industry, this clinic will take charge of industrial accidents and diseases and will educate men to direct health services as well as to supervise the care of men in factories, departmental stores and industries in general. Dr. Pedley, a graduate of McGill who is coming to the Faculty of Medicine as a lecturer in industrial hygiene, will be in charge of the new clinic. He has resigned his position as associate professor of industrial medicine of Columbia University. Dr. Grant Fleming, recently appointed director of public health and preventive hygiene at McGill, will have charge of this department of the university, while Dr. W. T. B. Mitchell will be assistant professor of mental hygiene. In addition to his services to the community at the Forum Building, Dr. Mitchell will instruct students in the study of mental hygiene as a public health problem.

GEORGE HALL

MANITOBA

The recent provincial elections resulted in the return of six medical men to the legislature, Drs. E. W. Montgomery, M. MacKay, J. H. Edminson, I. M. Cleghorn, H. McGavin and E. J. Rutledge. Dr. E. W. Montgomery who is Professor of Medicine in the University of Manitoba was elected as a supporter of the Bracken Government, and it is understood that he is to be appointed Commissioner of Health for the province. In this capacity he should be able to render distinct services to the cause of public health. He has been on the board of the Manitoba Tuberculosis Sanatorium from its inception and has always been keenly interested in the broader aspects of medicine. The other doctors will be a source of strength to the legislature especially when questions relating to medicine or education are raised.

A tubercular clinic was held at Shoal Lake on July 7th and 8th in the offices of Drs. Bardal and Yule. Over seventy patients were examined both physically and with x-ray by Dr. D. A. Stewart and Dr. Ross of the sanatorium staff. The monthly meeting of the North Western Medical Society was held on July 8th and was addressed by Dr. D. A. Stewart on "Septic infections of the lungs."

Dr. Wm. Rogers is retiring from the Honorary Attending Staff of the Winnipeg General Hospital.

The Medical Alumni Association will present a bust

of the late Dr. Gordon Bell to the Medical College at the opening in the fall. The bust was executed by Mrs. Hilliard Taylor and is pronounced a good likeness.

Dr. R. W. Richardson has engaged in practice in Brandon with Dr. Templeton.

Dr. Wm. Boyd has returned from an extended tour which embraced Toronto, Vancouver and the principal points in Saskatchewan. At Toronto he attended the annual meeting of the Canadian Medical Association where he took part in a symposium on the gall bladder discussing the pathology of that organ. In company with Professor B. P. Watson of Columbia University, New York, and Drs. Clarence Starr, John Oille and J. G. Fitzgerald of Toronto he addressed the four day summer school at Vancouver. On their return Dr. Clarence Starr and he visited the following points in Saskatchewan under the extra-mural post-graduate scheme: Regina, Saskatoon, North Battleford, Prince Albert, Yorkton, Rosetown, Moose Jaw, Weyburn, and Swift Current.

The annual meeting of the Manitoba Medical Association will be held in the Royal Alexandra Hotel, Winnipeg, on September 12th, 13th, and 14th. The visiting speakers will be Drs. A. T. Bazin and Campbell Howard of Montreal, Dr. J. K. McGregor of Hamilton, and Drs. Alan Brown and T. C. Routley of Toronto.

ROSS MITCHELL

SASKATCHEWAN

Dr. Clarence Starr, Professor of Surgery, University of Toronto, and Dr. Wm. Boyd, Professor of Pathology, University of Manitoba, have visited the Saskatchewan District Medical Societies giving a course of lectures and clinics, under the extra-mural post-graduate scheme. These were most interesting and instructive, and were greatly appreciated by those in attendance.

Charles S. Crawford, M.D. (Man.), L.M.C.C., has begun practice at Quill Lake. Norman M. Bellas, M.D.

(Man.), L.M.C.C., has opened an office at Prince Albert. J. M. Miller, M.B. (Tor.), L.M.C.C., is now practising at Moose Jaw.

The annual meeting of the Saskatchewan Medical Association will be at Moose Jaw, September 20th and 21st. A very excellent programme is being arranged. Dr. A. T. Bazin and Dr. Campbell Howard, Montreal, Dr. Alan Brown, Toronto, Dr. J. K. Mac-

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Gregor, Hamilton, will be the speakers from outside the province. Every doctor in the province is urged to be present, if at all possible. Besides the professional programme, an excellent entertainment is assured for

the doctors and their wives. Dr. T. C. Routley, Secretary of the Canadian Medical Association will be present and will address the meeting on the business side of medicine in Canada.

ALBERTA

The post-graduate clinic held in the Royal Alexandra Hospital, July 7th, was attended by over one hundred physicians from the city and surrounding country. The enthusiasm shown and large attendance indicate how greatly the medical profession appreciates the service given by these clinics held under the auspices of the Canadian Medical Association.

After supper served through the courtesy of the Medical Superintendent, Dr. H. E. Smith, a clinic on "Chest pain" illustrated by four hospital patients under treatment for this condition, was given by Dr. John A. Oille, Professor of Clinical Medicine in Toronto University. The subject was treated in a most comprehensive and lucid manner and the diagnosis and treatment fully and completely explained by Dr. Oille. The benefit derived from this lecture by the local physicians will undoubtedly bear fruit, in the better handling and care given this class of patient.

At a later hour Dr. Oille also spoke on "High blood pressure and hyperthyroidism," and again demonstrated his remarkable facility of stating his case in such a manner as to make it easy of comprehension to his audience.

Dr. J. G. Fitzgerald, Professor of Hygiene of Toronto University and Director of the Connaught Laboratories, discussed fully the question of anaphylaxis and associated conditions connected with the use of the various sera on the human subject including some comments on the Schick and Dick tests, closing his address by remarks on the prophylaxis of scarlet fever and diphtheria. The highly scientific nature of the work carried on by the Connaught Laboratories was described in this very informative address by Dr. Fitzgerald who afterwards cleared up the difficulties expressed by those who took part in the discussion which followed.

T. H. WHITELAW

Dr. Edgar Allin and Dr. Morton Hall who are visiting medical centres in Great Britain and the continent will return about the middle of August.

Dr. Mackay and Dr. I. W. T. McEachern are attending the surgical clinics of Vienna at present and will also visit medical surgical centres in France and Great Britain before returning about September 1st.

Dr. H. M. Vango, Assistant Professor of Pathology, University of Alberta is leaving Edmonton shortly to take post-graduate work in Vienna, Austria.

The following were recently appointed by the Academy of Medicine to act as an Advisory Medical Committee to the legal organization of the Canadian Social Hygiene Council, Dr. Harold Orr, Dr. G. Swallow, and Dr. T. H. Whitelaw.

The second of this year's series of extra-mural post-graduate lectures were given during the week of June 28th to July 2nd to the physicians of Alberta by Professor John Oille, of the Department of Medicine, Toronto University, and Professor Fitzgerald, Director of the Department of Hygiene and Preventive Medicine, Toronto University. Great interest was shown and appreciation expressed of the high value of these lectures at the various centres in the province which were visited.

Dr. Oille spoke on "The heart in relation to pregnancy" and on "Chest pain" and Professor Fitzgerald on "The principles of active and passive immunization against communicable diseases."

The annual meeting of the Alberta Medical Association will be held in Calgary on the 14th, 15th, and 16th of September, and it is expected that there will be a large attendance. Professors Campbell Howard and A. T. Bazin, of McGill University, Dr. Alan Brown, of Toronto University, and Dr. McGregor, of Hamilton, will give clinics and lecture on special subjects. Dr. T. C. Routley, General Secretary of the Canadian Medical Association, will accompany the visitors.

Dr. C. E. Smyth, of Medicine Hat, has sold his practice to Dr. D. N. McCharles, of Empress, and is spending the summer in Ontario. His health is much improved since returning from California. He plans to settle in Vancouver eventually.

Dr. W. D. Higgs, of Victoria, B.C., a graduate of Toronto University, 1926, is now practising in Calgary.

Dr. H. Lander, of Winnipeg, has settled in Veteran, Alberta.

Dr. E. E. Rogers, of Cluny, has accepted a contract with a local industry at Redcliffe, where he will practise.

Dr. R. C. Henderson, of Clive, has left for northern Alberta, where he will choose a new location.

Dr. B. C. Cohen, formerly of Warner, is now practising in Gadsby.

Drs. John Collison and C. M. Sanders of Red Deer, have disposed of their practices to Dr. C. R. Bunn, of Manitoba. Dr. Sanders will shortly leave for Victoria, B.C., near which city he will follow his hobby of fur farming.

Dr. L. R. Rogers, of Forestburg, has left for a three months' post-graduate course in the east. Dr. Waters, a 1926 graduate of the University of Alberta, will look after his practice in his absence.

Dr. Walter Morrish, who has just returned from post-graduate work in Europe, is relieving Dr. Borden of Coleman for the summer.

It is with deep regret that we record the deaths of Dr. Fred. W. Stockton of Calgary and Dr. A. S. Elliott of Evansburg. Both had practised in this province for many years, and were highly esteemed by their colleagues.

Dr. L. O. Beauchemin, of Calgary, returned home recently having spent the past two years in post-graduate work in Paris.

We are sorry to learn that Dr. J. S. McEachern, of Calgary, is making only slow progress towards recovery from his prolonged illness.

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BRITISH COLUMBIA

The summer school of the Vancouver Medical Association held June 21st to 24th, has this year been even more successful and popular than ever before. The registration was, we understand, the largest in the history of the school and the attendance, which began in earnest at 8 o'clock on Tuesday morning, continued undiminished until the end on Friday night. The selection of the Hotel Georgia as the place of meeting was a happy one. The acoustic properties of the hall were very satisfactory and the spacious lounge and rotunda formed convenient places for social relaxation.

We congratulate the hard-working committee upon its undoubted success and vigilant attendance to all the details—and they are many—which make for the smooth working of such a function. Especially we were struck with the punctuality with which the lectures started, and, what is, perhaps, quite as important, stopped. No delay, no over-lapping and yet no lecture appeared to be unduly hurried.

It has been a great pleasure to meet the various lecturers even in the brief manner possible at such a gathering. We hope they have enjoyed their short stay with us and left with kindly regret. The luncheon arranged conjointly with the British Columbia Medical Association and addressed by Dr. Moffitt of San Francisco, formed a lighter interlude of friendly reunion.

The annual meeting of the British Columbia Medical Association was held at the Hotel Georgia, Vancouver, on June 22nd. Dr. H. E. Ridewood of Victoria, assumed office as President, and the following other officers were elected: Dr. Wallace Wilson, President-Elect; Dr. W. A. Clarke, New Westminster, Vice-President; Dr. Theo. H. Lennie, Secretary-Treasurer.

The first meeting of the new Executive of the British Columbia Medical Association was held immediately after the annual meeting, when Chairmen of Standing Committees were elected as under: Dr. Geo. Hall of Victoria, Legislative Committee; Dr. A. J. MacLachlan of Vancouver, Industrial Service Committee; Dr. A. C. Frost, of Vancouver, Constitution and Credentials Committee; Dr. Lyall Hodgins, of Vancouver,

Publicity and Educational Committee; Dr. A. W. Bagnall, of Vancouver, Ethics and Discipline Committee.

Apropos the court case of Dr. Geo. E. Seldon vs. Zambowski, referred to in the last number of the *Journal*. Affecting, as it did, every medical man in the Dominion, it will be gratifying to learn that this case was successfully appealed.

We regret exceedingly to record the death of Dr. Rothwell of New Westminster, B.C. One of the oldest practitioners in the province, having practised here for over thirty years, Dr. Rothwell will be greatly missed by his many medical friends. As a member of the Provincial Legislature he did much good work for the profession and was ever watchful in its interests. He represented the Fraser Valley Medical Society on the Executive of the British Columbia Medical Association and his sound judgment on medical economics proved of great value. An obituary will be found in another column of this issue.

Another death we have, unfortunately, to report, is that of Dr. J. C. Elliott of Chilliwack, who passed away on July 4th., as the result of an automobile accident. About 3 a.m., July 2nd, when Dr. Elliott was returning from a professional call, his car collided with a British Columbia Electric special train at the railway crossing at Sardis. Dr. Elliott sustained terrible injuries. Our deepest sympathy goes out to his widow and family. Obituary will be found elsewhere in this number.

Dr. R. B. Brummitt, of Vancouver, is relieving Dr. Stuart of Mission, for two months.

Dr. M. R. Basted has been appointed medical officer at Nakusp, B.C., in succession to Dr. P. J. Emerson, whose resignation there became effective on July 1st.

Dr. E. A. Campbell, who has for some months been acting as an interne at the Vancouver General Hospital, left on June 28th for Bella Bella where he will act as assistant to Dr. Geo. Darby. J. EWART CAMPBELL

UNITED STATES

The Interstate Medical Post-Graduate Assembly of North America will hold a meeting in Kansas City during the week of October 17th. Morning, afternoon and evening meetings are being arranged for. The morning session will be devoted chiefly to diagnostic clinics at the several hospitals. Among the many eminent British, Canadian and South American physicians who have promised to give addresses are the

following: Drs. Alan Brown, Toronto; McKim Marriott, St. Louis; Fritz B. Talbot, Boston; Prof. Adolph Maffei, Brussels, Belgium; Mr. John S. McArdle, Dublin, Ireland; Sir John F. H. Broadbent, London, England; Drs. Sigmund Frankel, Vienna, Austria; C. H. Best, Toronto; Elliott P. Joslin, Boston; J. C. Meakins, Montreal, and Dean Lewis, Baltimore.

Further Experimental Studies in Cholecystography.—Large doses of the dye were administered by Julius Friedenwald, Maurice Feldman and Francis X. Kearney, Baltimore, by mouth and directly into various parts of the small bowel at frequent intervals. From these experiments it is evident that when tetraiodophenolphthalein is administered orally for purposes of cholecystography, even when given

in massive doses, it does not produce degenerative or necrotic changes in the liver or kidneys.—*J. Am. M. Ass.*, July 16, 1927.

At a statutory meeting of the Royal College of Physicians of London on April 11th, Sir John Rose Bradford was re-elected President for the ensuing year.

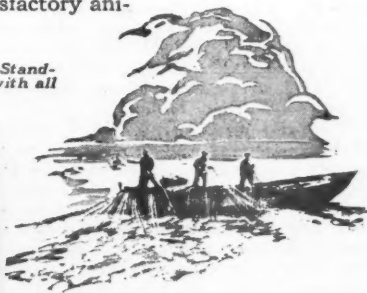
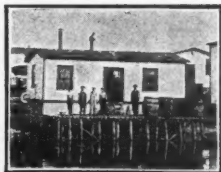
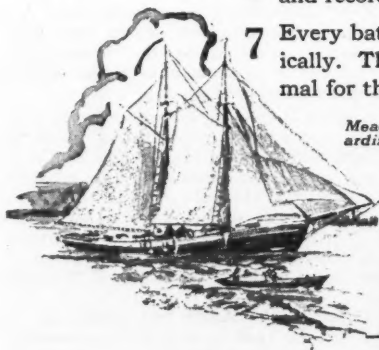


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Book Reviews

Transactions of the American Surgical Association.
Vol. XLIV. William J. Dorran. 1926.

This volume contains the papers read before the Association at the meeting held May, 1926. About one-quarter of its space is given to the surgery of the stomach and gall bladder. These subjects are unusually well covered. Recent advances in sympathectomy in vascular disease of the extremities are reported in a most interesting communication. There are also many excellent papers covering a large part of the general surgical field.

The last quarter of the work is devoted to a very comprehensive review of plastic surgery in its various branches, including cleft palate, skin grafting, tendon transplantation, etc.

On the whole this volume fully equals the high standard for which the transactions of this association are noted.

L. H. MCKIM

Muscular Contraction and the Reflex Control of Movement. J. F. Fulton, B.Sc., M.A., Ph. D. 608 pages, illustrated. Price \$10.00. The Williams & Wilkins Co., Baltimore, 1926.

The first part of this excellent monograph deals, after an historical introduction, with the special features of the mechanical and electrical responses of muscle, from the peripheral standpoint. Chronaxia, the latent period, the isometric twitch, summation, and the electrical phenomena of muscle are dealt with in the nine chapters making up this part.

The second part of the monograph surveys the rôle played by the central nervous system in the integration of the reflexes of movement and posture. The methods of analysis which were described in the first part are applied to the study of the reflex response of muscles. The chapters are essays, each dealing with special phases of the subject, in a well-connected and interesting fashion. Excitatory and inhibitory processes receive attention. The myotatic reflexes form the subject of one chapter and one here finds an excellent survey of the experimental work done in this important and interesting field of physiology. The chapter devoted to the complicated question of the tonus of skeletal muscle will also be found of great interest and value. The evidence for and against the sympathetic part in the control of muscle tonus receives its due and impartial treatment. The "shortening and lengthening" reaction, reciprocal innervation, the function of the cerebellum and the nature of "higher control" form the subjects of the latter chapters. An appendix deals with some of the special methods used throughout this work in the study of muscle contraction.

There are several features which make this monograph interesting as well as valuable to workers in physiology and medicine. The evidence from experiment concerning special features of muscle contraction must be exceedingly difficult to arrange in a clear fashion, and this has been done in this monograph. Besides being well written, the book is excellently illustrated by over 200 figures, and each figure is very conveniently placed in relation to the text. The reader is struck by the fact that the author is dealing at first hand with his subject; the book is based on much research work done by the author, as many of the references and figures show. One can commend also the treatment of the two divisions of this subject, and the way in which liaison has been established

between them. The study of muscular function from the peripheral point of view leads forward into the study of integration of muscular movement by the central nervous system. Too often these aspects of movement are separated with a good deal of artificiality, and we congratulate the author in his success in the task of bringing the points of contact together.

The bibliography contains 1,066 references to the literature of the subject, and this, with the author index, makes the monograph one of great value to laboratory workers in physiology and medicine.

V. H. K. MOORHOUSE

Compendium of Regional Diagnosis in Affections of the Brain and Spinal Cord. Robert Bing, translated from the 6th German edition by F. S. Arnold, B.A., M.B., B.Ch. Third edition. 204 pages, 197 illustrations. Price \$6.00. C. V. Mosby Co., St. Louis, 1927.

This new revised and enlarged edition of Dr. Bing's Compendium, will be welcomed by all who have been acquainted with the earlier editions. While there seems to be little change in the text, very noteworthy alterations and additions have been made in the matter of illustrations. Approximately twenty-five new ones appear and many of the diagrams have been revised in an effort to make them serve their purpose better. The book was always noted for the excellence of its diagrams but in this edition an already high standard has been surpassed. In three or four instances the German nomenclature has been left in diagrams, but this is a minor fault.

The procedure in diagnosis set forth is, in the opinion of the reviewer, the only satisfactory one, viz., one based upon the anatomy and physiology of the nervous system. Practically every section opens with a concise, clear account of the anatomy and physiology of the part under consideration. The clinical phenomena resulting from various lesions are then presented. Throughout the text is characterized by lucidity and conciseness. It is brief and in continuous reading gives the impression of high concentration, but these are the desirable features of a good compendium.

The book is unhesitatingly recommended. The author and publishers in this new edition have made possible a valuable addition to the neurologists' library. Moreover this is an example of a real edition; an already good book made better.

There is a rather staggering difference in the price of the American and English productions. With the exception of slight difference in the binding, the books are identical and yet the American copy sells for \$2.00 more than the English. The publishers in the United States are freed from any suspicion by reason of the fact that the disparity in price seems to be entirely due to the heavy duty imposed upon letter press imported into the United States.

A. T. MATHERS

The Normal Chest of the Adult and Child. J. A. Myers and others. 400 pages, 143 illustrations. Price \$5.00. Williams & Wilkins Co., Baltimore, 1927.

The value of recognizing the normal cannot be too constantly stressed. Most men realize at some time or another that they cannot understand pathological changes with any degree of accuracy unless they have

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a standard by which to judge those changes. How many men realize, however, that this standard is one which it is very difficult to establish, especially in set terms. Anatomists now use the word "normal" with very much the same latitude as we use the word "healthy". Both of these may be defined in words, but to apply them in any given instance is quite another thing. The standard in either case must be one that allows of a certain amount of variation.

The "normal chest" provides its full share of difficult definition, and a book devoted entirely to it arouses a certain degree of expectation. The volume under review hardly fulfils that expectation, but it contains sound and detailed description which is useful for reference.

The chapter on the acoustics of percussion and auscultation deals with the fundamental principles of mathematical detail which assures one of thoroughness, but is not easily followed by those without mathematical training. Interesting experiments on the thorax, however, are quoted. No fresh light is thrown on the exact formation of râles, and we note that the origin of the fine crepitant râle is assumed to be either "in the alveoli themselves or in the small air passages leading directly into the alveoli". This is a point on which views differ.

On the whole, the book may be recommended, particularly for the advanced student, and if it impresses him with the necessity for frequently, very frequently, examining chests, both normal and abnormal, it will have fully justified its existence.

H. E. MACDERMOT

Manual of Gynecology. John Osborn Polak, M.Sc., M.D., F.A.C.S. Third edition. 402 pages, 145 illustrations. Price \$5.00. Lea & Febiger Co., Philadelphia, 1927.

This is a book which will be found of great value to medical students. It will be of help to general practitioners and also appreciated by specialists. The author avoids theoretical or controversial questions and presents only what has been accepted generally as sound statements and good practice. Special attention is given to pathology and diagnosis, and long detailed descriptions of operations are omitted. Treatment of common gynecological conditions is precisely stated and the simpler operative procedures, which might be performed by other than gynecological specialists, are given in detail. The printing in italics of the salient points throughout the book, impress them upon the mind of the reader as well as make it easy to review any subject upon which one wishes to refresh one's memory quickly. Only upon debatable subjects does the author give his own opinion. The last chapter is an interesting summary of the effect of the glands of internal secretion upon the development of the sexual organs, and here again only what is fairly well established is considered. Treatment by endocrines, which is yet more or less empirical or experimental, is avoided. Dr. Polak has succeeded in supplying a concise and definite exposition of the diseases peculiar to women, which he states in the preface was his objective.

F. A. CLELAND

Obstetrics for Nurses. Joseph B. DeLee, A.M., M.D. 8th Edition. 610 pages, illustrated. Price \$3.00. W. B. Saunders Co., London and Philadelphia. McAinsh & Co., Toronto, 1927.

The author has thoroughly revised the book, omitting some material and some illustrations, and has brought it up to date by adding all recent developments in obstetrical nursing. The illustrations are numerous, clear and help to clarify the text.

The use of iodine and mercurochrome sprayed on the perineum, as a preparation for delivery, is care-

fully explained. A new chapter has been added on Gwathmey's synergistic analgesia, a reprint of Dr. Gwathmey's own description. The newer methods of infant feeding and methods of identifying babies in hospitals by foot prints and numbers tied on with the cord tie, are also explained.

A book which for years has been used in all the larger maternity hospitals as a standard, and which in the present edition is both complete and modern, compels attention.

ELEANOR PERCIVAL

Treatment of Venereal Disease in General Practice.

E. T. Burke, D.S.O., M.B., Ch.B. 162 pages, illustrated. Price 5/- net. Messrs. Faber & Gwyer, London, 1927.

Probably no diseases are more carelessly treated, no diagnoses of cure more lightly made than are the group included in venereal diseases.

Dr. Burke presents the problem in his new book on treatment of venereal disease in general practice in a striking and forceful way. The careful perusal of such a book with the lessons therein permitted to sink into the consciences of those upon whose heads "the cap fits"—and there will not be many heads uncapped—may prevent many childless marriages and much marital syphilis.

Dr. Burke's period of treatment seems very short in syphilis, particularly in the primary stage with a negative Wassermann. His condemnation of mercury and almost worship of bismuth is but voicing his own opinions and those of many other modern syphilographers. Clinical experience is yet too short to permit the putting of mercury into the discard.

The concise and apt remarks on gonorrhœa leave little to be said. There is much food for thought. The enthusiasm expressed for the use of vaccines is not indulged in by all, but the detoxicated vaccines have not been sufficiently used in this country to attempt adverse criticism.

We have a venereal problem; the standard of cure eclipses any tragedy. Endless suffering has been the result. In this book is a concise and clear summing up of the many difficulties. No one attempting the treatment of these social diseases can afford to neglect to reinforce his knowledge of maladies which are such a scourge in our modern life.

R. E. POWELL

Hospital Housekeeping and Sanitation. Nora P. Hurst, R.N. 148 pages. Price \$1.25. The C. V. Mosby Co., St. Louis. McAinsh & Co., Toronto, 1927.

This small volume is a handbook rather than a text-book on the subject, and presents an outline of the various questions pertaining to hospital housekeeping. The details are limited and need considerable amplification in many instances, and correction in others. Typographical errors are not infrequent, and grammatical mistakes abound.

Probably the chief use of this book would be as a reference in a smaller hospital isolated from the larger centres.

JESSIE BOYD SCRIVER

Local Anæsthesia in Otolaryngology and Rhinology.

James Joseph King, A.B., M.D. With Supplement on the Toxic Effects of Local Anæsthetics. Edited by Emil Mayer, M.D. 205 pages, 21 illustrations. Price \$5.50. Paul B. Hoeber, New York. Macmillan Co. of Canada, Toronto, 1926.

In part I, the author deals with general considerations relating to local anæsthesia. He points out the great advances in surgery that the routine use of local anæsthesia has made possible. He discusses the contra-indications and stresses the need for great care in the use of any preparation for local anæsthesia.

There follows a detailed study of cocaine, novo-

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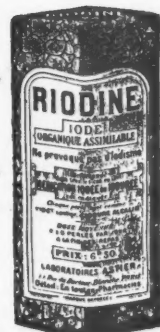
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caine and of the cocaine substitutes, and he concludes that novocaine is the most commendable of all the local anæsthetics known for infiltration, conduction or intraspinal anæsthesia. There is an excellent chapter on epinephrin. Its use with local anæsthetics is important. The vasoconstriction caused by it delays the absorption of the anæsthetic and lessens hæmorrhage. In discussing toxicity and its treatment he suggests that if there are convulsions they should be controlled by the inhalations of ether. Cardiac stimulants are in order. Depressants such as morphine are contra-indicated. The injection of not more than 2 c.c. of epinephrin directly into the heart has been advocated. In discussing synergistic anæsthesia the author favours the injection of 2 c.c. of 50 per cent magnesium sulphate solution combined with 2.5 per cent novocaine and $\frac{1}{4}$ of a grain of morphine three hours before operation and repeated at half hour intervals till three doses have been given. At the time of operation, one-half hour after the last injection, a very small amount of novocaine is sufficient for local infiltration. Then follow some very excellent chapters on the detailed methods of administering local anæsthesia in the nose, throat, larynx and the ear.

Part II of the book contains the complete reports of the various committees of the American Medical Association made to the Therapeutic Research Committee of the Council on Pharmacy and Chemistry, on the study of the toxicity, advantages and disadvantages of the various local anæsthetics in nose and throat work. Their findings may be summarized as follows:

Local anæsthesia should be used only when the patient is in the recumbent position. The quantity of any drug used should be measured. Any injection should be carried out slowly. Fatalities usually occur at once. The best method to combat toxicity from any local anæsthetic is to use artificial respiration, cardiac massage and possibly the intracardiac injection of not more than 2 c.c. of epinephrin. A one per cent solution of novocaine is the safest anæsthesia for infiltration.

This book can safely be recommended as a ready reference book for the general surgeon, the urologist, the dentist and especially for the otolaryngologist. It contains a fund of very valuable and very necessary information relating to local anæsthesia and the various preparations used for local anæsthesia. W. J. McNALLY

Exophthalmic Goitre. John Eason, M.D., F.R.C.P.E. 215 pages, illustrated. Price 12/6 net. Oliver and Boyd, Edinburgh, 1927.

This illustrated monograph contains 191 pages and a bibliography of the recent literature. A full and concise review is given of the modern ideas upon the various phases of Graves' disease. The opinions of authorities are collected and criticized, and are supplemented by pertinent expression of the author's views upon the controversial points.

In the opening chapter upon anatomy and physiology the modern conception of thyroid structure as formulated by Williamson and Pearce is briefly set forth. The function of the autonomic nervous system, and the mechanism of the oculo-cardiac reflex, are discussed in detail.

In considering the etiology of Graves' disease the author brings out very clearly the importance of inborn diathesis, of continued nervous strain of an unpleasant nature, and of such infections as influenza.

Heart failure receives a prominent place in the discussion of the clinical course. Autonomic imbalance is defined and described with care. The author concludes that in established exophthalmic goitre the symptoms and signs referable to the autonomic system are due to an increased tone of the entire system, and

not to preponderance of the sympathetic or parasympathetic divisions.

The functions of the liver and their place in metabolism are set forth in detail, and many interesting analogies are drawn between Graves' disease and diabetes mellitus. The circulatory disorders of exophthalmic goitre are also compared with those of aortic regurgitation.

It is stated that interesting relationships exist between heart rate, blood pressure, and basal metabolic rate. In the absence of myocardial failure the coefficient of correlation between heart rate and basal metabolic rate is 0.74. The corresponding coefficient between pulse pressure and basal metabolic rate is 0.62.

In the chapter on pathology the modern views of Williamson and Pearce upon the subject of the pathology of exophthalmic goitre are stated in some detail. In dealing with prognosis the author carefully stresses the importance of adequate protection of the patient from further exposure to the exciting factors.

The routine treatment should be medical, with surgical measures held in reserve. Absolute physical and mental rest is necessary for a period varying from six weeks to twelve months. The patient must be carefully guarded against the etiological factors after this period of rest. Insulin and iodine each have an important place in the therapy.

Surgical treatment should be withheld until it is clearly indicated. The author concludes that there are three classes of patients in which operation should be advised. In the first group are those cases in whom medical treatment is failing, or cannot be properly carried out. The second class includes patients showing progressive heart failure. Finally, cases of toxic adenoma will not improve unless operated upon.

R. R. FITZGERALD

The Meaning of Disease. William A. White, A.M., M.D. 220 pages. Price \$3.00. Williams & Wilkins Co., Baltimore, 1926.

Dr. White dwells on the fact that medicine to-day is in need of an adequate theory of disease. It is indeed no paradox to say that the more knowledge we gather regarding diseases the further we may be from understanding what the process itself is. This is no criticism of the gathering of such facts. It is rather to show that there should now be an attempt to make generalizations from the facts, because, as he reminds us, "It is a well-founded historical generalization that the last thing to be discovered in any science is what the science is really about. Men go on groping for centuries, guided merely by a dim instinct and a puzzled curiosity, till at last 'some great truth is loosened'."

There will always be those to whom the philosophical aspect of medicine seems to bear little useful fruit, and to these it is not likely that Dr. White's essay will be very attractive. Even these however, should be reminded of the aphorism that "in our most theoretical moods we may be nearest to our most practical applications". For others more interested in the world of ideas this book will be found to contain much that stimulates thought. The subject is a difficult one, but with occasional exceptions Dr. White deals with it in clear language, reinforced with many illustrations from other works on psychology and philosophy.

H. E. MACDERMOT

We are asked to announce that "The Beloved Physician", by R. M. Wilson, which was reviewed in our issue for December last, is on sale by Messrs. Macmillan Co. of Canada, Toronto.